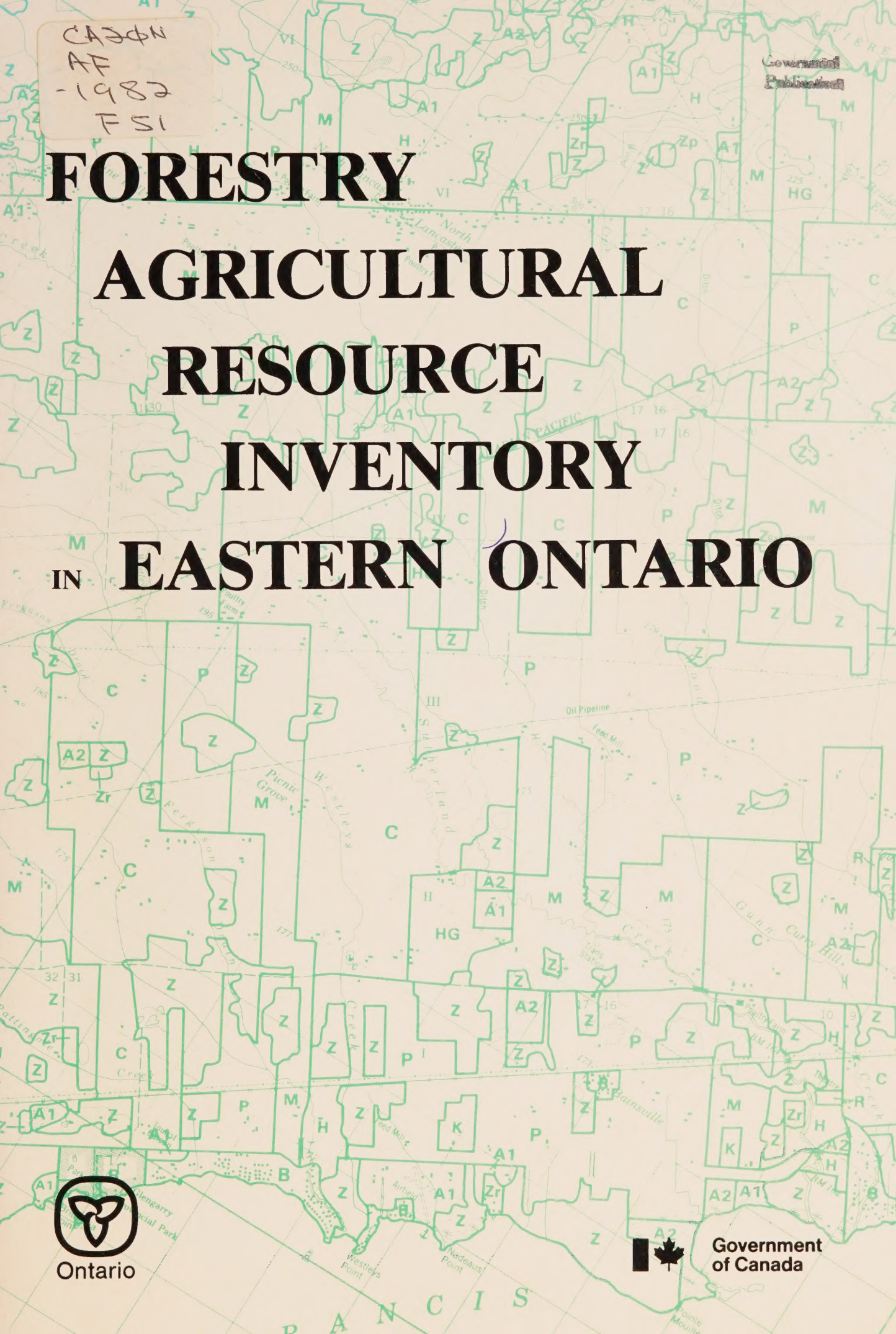
FORESTRY AGRICULTURAL RESOURCE INVENTORY IN EASTERN ONTARIO



Ontario

Government of Canada

THE FORESTRY AGRICULTURAL RESOURCE INVENTORY IN EASTERN ONTARIO: A LAND USE INVENTORY

ONTARIO MINISTRY OF AGRICULTURE AND FOOD

ONTARIO MINISTRY OF NATURAL RESOURCES

1982

This project is part of the New Forests in Eastern Ontario Program, and is funded equally under the Community and Rural Resource Development Subsidiary Agreement by the Federal Department of Regional Economic Expansion and the Ontario Ministry of Treasury and Economics.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGEMENTS

David R. Turner: Preparing the maps for digitizing, compiling and writing the final report

The field crews:

	Agriculture	Forestry	Drainage Inventory Crew
1978	Darryl Crewson	John Kus	
	Monica Tutt	Buddy Verch	
1979	Darryl Crewson	John Kus	
	Yves Delorme	Ellga Jansons	
	Ann Marie Kavanagh	Lesley Moran	
	Michel Levert	Beth Smith	
	Monica Tutt	Buddy Verch	
	Ian Walker		
1980	Margaret Beer	Brenda Baker	Francois Dutrisac
	Janet LeBel	Norma Burnside	Marc Lafleche
	Alain Legault	Debbie Green	Charles Monette
	David McGuinty	Rick Grey	Paul Rooney
	Jim Oosterholt	Janet Lyon	Doug Sova
	Tony Van der Byl	Barbara McPherson	Faye Vogan

Co-operation and assistance during the project:

Ontario Ministry of Agriculture and Food
Extension Branch Offices:
Embrun (Russell County)
Alexandria (Glengarry County)

Agricultural Engineers:
Bob Kelly
Tom McPherson
Pat Plue
Glen Slater

Ontario Ministy of Natural Resources
Bourget Office (Russell County)

Agriculture Canada — Land Resource Research Institute,
Land Use Evaluation Section, Ottawa
Dr. J. Dumanski, Head
Mr. T. Huffman, Technical Officer

Kemptville College of Agricultural Technology
John Clark, Head, Agricultural Engineering Section

Supervision and administration:

Ontario Ministry of Agriculture and Food
Food Land Development Branch:
V.I.D. Spencer, Director
G. Jackson, Associate Director
Bob van den Broek, Soil Survey Party Leader, Guelph
Fay Lando, Project Officer

Ontario Ministry of Natural Resources
Cornwall District Office:
R. Morin, District Manager
S. Reid, Management Forester
B. Warwick, Forest Supervisor

For providing the facilities, expertise and assistance in digitizing the maps:

Ontario Hydro, Route and Site Selection Division:
Leigh Harmeson, Supervising Planner
Laura Ives, Senior Planner
Janice Witty, Supervisor — Department Services
Gary Bennett, Senior Data Control Clerk
Carol Lavigne, Data Control Clerk
Vita Jevric, Assistant Data Control Clerk

For their interest and support in following the progress of the project:

Ontario Ministry of Treasury and Economics
Economic Development Branch:
H. Gosar
D. Hughes

Department of Regional Economic Expansion (DREE)
Dick Pryde

Ontario Centre for Remote Sensing
Dr. Simsek Pala, Research and Training Supervisor
R. Mussakowski, Ecology Research Officer

Doug Ross: Map compilation

1
INTRODUCTION

From 1978 to 1980 the Ontario Ministries of Agriculture and Food (OMAF) and Natural Resoures (MNR) undertook an inventory to record the existing forestry, agricultural and other land uses in the six eastern counties of Ontario (Figure 1). The Forestry Agricultural Resource Inventory in Eastern Ontario (FARINEO) is part of the New Forests in Eastern Ontario program, a five-year development program designed to encourage the development of forest programs in Eastern Ontario (Appendix 1). The New Forests program is funded equally by the Federal Department of Regional Economic Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

FARINEO was designed to "provide resource data upon which recommendations would be based for the optimization of agricultural and forestry production in Eastern Ontario".[1] This goal was to be reached by conducting "a resource inventory of the present land use, agricultural, forest and woodlot cover and other uses in the study area".[2] Inventories of forest lands, tile and municipal drainage and farm buildings were also conducted. These inventories were carried out in Dundas, Glengarry, Grenville, Prescott, Russell and Stormont Counties in Eastern Ontario (Figure 2 and Table 1).

Table 1

FARINEO COUNTY AND TOWNSHIP CODES

06 Dundas County

01 Matilda
02 Mountain
03 Williamsburgh
04 Winchester

11 Glengarry County

01 Charlottenburgh
02 Kenyon
03 Lancaster
04 Lochiel

12 Grenville County

01 Augusta
02 Edwardsburgh
03 South Gower
04 Oxford-On-Rideau
05 Wolford

38 Prescott County

01 Alfred
02 Caledonia
03 East Hawkesbury
04 West Hawkesbury
05 Longueuil
06 North Plantagenet
07 South Plantagenet

42 Russell County

01 Cambridge
02 Clarence
03 Russell

44 Stormont

01 Cornwall
02 Finch
02 Osnabruck
04 Roxborough

[1]Food Land Development Branch, Ontario Ministry of Agriculture and Food, "Reference Information Re The Forestry Agricultural Resource Inventory in Eastern Ontario", Toronto, 1978 (Mimeographed).
[2]Ibid., p. 1.

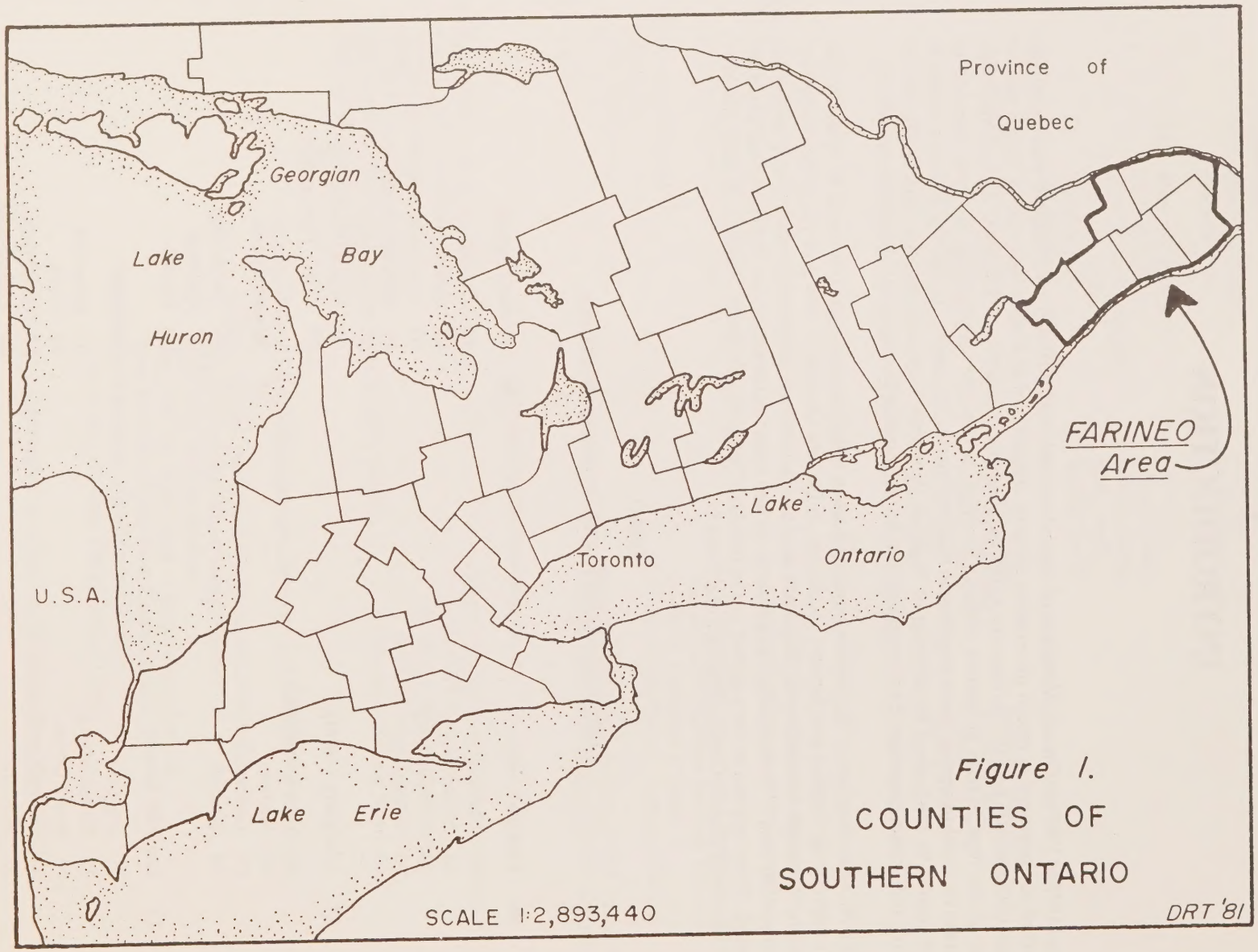
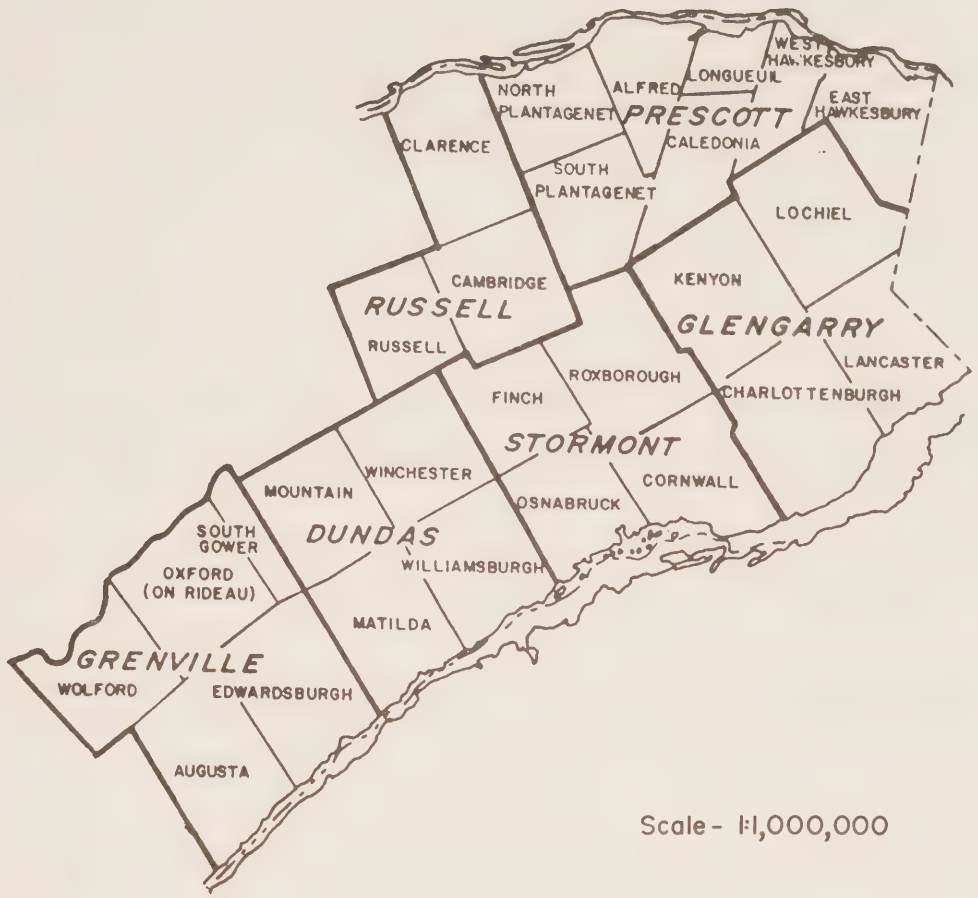


Figure 1.
COUNTIES OF
SOUTHERN ONTARIO

Figure 2: TOWNSHIPS OF EASTERN ONTARIO - FARINEO AREA



The initial request for the agricultural inventory came from the Ontario Ministry of Agriculture and Food staff in Eastern Ontario. Requests for specific data on agriculture in Eastern Ontario were being made, and were expected to continue. The eastern OMAF offices had neither the staff, resources nor time to deal effectively with the incoming requests. It was also anticipated that specific data regarding agriculture would be required for a major study of the South Nation River basin.

The Hybrid Poplar program was initiated in response to a need for pulp wood for the pulp and paper mills at Cornwall and Hawkesbury. FARINEO set out to identify the idle or underutilized farm land which might be available and suitable for the production of new hybrid poplar varieties.[3]

The FARINEO inventory will provide a valuable data base on land use for these two projects: the South Nation River Basin study and the New Forests in Eastern Ontario (Hybrid Poplar) program.

Traditional land use studies and methodologies have placed little emphasis on agricultural lands. Agricultural land uses have traditionally been designated simply as "cropland" or "farmland".[4] Such generalizations were not suitable for the FARINEO land use study, so a detailed methodology for identifying various agricultural land uses was sought. The method selected to record agricultural land use activities in Eastern Ontario was developed and field tested in 1977 by the Land Resource Research Institute of Agriculture Canada for a land use survey of the Regional Municipality of Ottawa-Carleton.

[3]Ibid., p. 1-2
[4]Huffman, T. *Agricultural Land Use Mapping* (Report to the Survey Committee Meeting). Ottawa, March 1979, p. 1.

Existing soil surveys provide detailed information about the soil, or land. The FARINEO land use survey tells us how we are using this land resource. By using agricultural land use systems, a measure of how intensively a parcel of land is used for agriculture can be made. The intensity of land use is dependent upon the type of crops grown and the relative proportions of these crops within the land unit. This approach is designed to recognize yearly rotation patterns so that in any given year the same proportion and mix of crops can be expected on each land unit. Each crop, however, would not necessarily be found in the same field every year.

In the FARINEO study, six different agricultural land use systems were used representing a different mix, proportion and rotation of crops. The FARINEO land use maps locate, quantify and qualify the agricultural land use systems and other land uses for each township in the study area.

This report has four objectives:

1. To provide a discussion of the historical develpment of the agricultural land use systems approach to land use mapping,
2. To describe the methodology used to inventory the forestry and agricultural resources of Eastern Ontario,
3. To record some preliminary observations on the forestry and agriculture in Eastern Ontario based on the inventory data, and
4. To provide information about the availability of the FARINEO information and maps, and to encourage their use and distribution.

2
HISTORICAL PERSPECTIVE[5]

One of the earliest attempts at classifying farms was undertaken by J.W. Spillman in 1908.[6] Spillman classified farming in the United States by examining gross saleable production. This was not a true land use study; rather, it was an economic classification of farms.

Agricultural studies that followed also used economic indicators. Whereas Spillman used just one parameter to classify farms (gross saleable production), subsequent researchers added new parameters such as types of capital and labour used, production techniques and products sold. These were used most commonly in combination to obtain a more representative economic farm classification.[7]

In 1930, the International Geographical Union initiated a world survey of agriculture based on land use to identify areas of arable land. The project was supplemented in Britain by surveys of soils and landscapes. This information package provided the base for British town and country planning.[8]

More recent studies have inventoried other physical resources as well as land use. A 1972 program in Connecticut established an agency to assemble information on geology, soils, hydrology, biology, the atmosphere and land use. Information collected was recorded on mylar (plastic) overlay maps and registered to a common base. In this form, the data is available to various groups responsible for land-related decision making in that state.[9]

Similarly, in British Columbia,[10] land uses within designated agricultural reserves were inventoried in the late 1960's. The resulting British Columbia Land Inventory (BCLI) was based on the Canada Land Inventory (CLI), which identified areas on the basis of the capability of the soils for agricultural use. This data was collected primarily by interpreting aerial photographs.

The CLI incorporated the present land use mapping program of the Geographical Branch of the Canada Department of Energy, Mines and Resources, underway since 1950. The classification system used six broad categories nation-wide: urban (3 sub-classes), agricultural (5 sub-classes: (i) horticulture, poultry and fur operations, (ii) orchards and vineyards, (iii) cropland, (iv) improved pasture and forage crops, (v) rough grazing and rangeland), woodland (2 sub-classes: (i)productive, (ii) non-productive), wetland, unproductive land and water. Mapping was done at 1:50,000 scale using aerial photographs, Census of Canada data and assessment field sheets. Most agricultural land uses in Eastern Ontario were designated as cropland or improved pasture and forage crops.[11]

[5]Considerable attention has been given to this subject in Robert C. Scace, *Land Use Classification Systems: An Overview. Working Paper No. 14.* Ottawa: Environment Canada, Lands Direcorate, 1981.
[6]Bonuzzi, V. "Method Changes in the Classification of Types of Farming" in Centre of Agricultural Geography, Institute of Agricultural Economy and Policy, University of Agricultural Sciences and Humanities. *Agricultural Typology and Land Utilization.* Verona, Italy: Centre of Agricultural Geography, 1972, p. 303
[7]Ibid, p. 303
[8]Vink, A.P.A. *Land Use in Advancing Agriculture.* New York: Springer-Verlag, 1975, p. 19
[9]Thomas, H.F. "Establishing the Land Use Data Base", in Frost Campus of Natural Resources, Sir Sandford Fleming College, *Perspectives on Natural Resources: Symposium 2 Land: Proceedings.* Lindsay: Sir Sandford Fleming College, 1979.
[10]Select Standing Committee on Agriculture. *Inventory of Agricultural Land Reserves in British Columbia.* Victoria: Select Standing Committee on Agriculture, 1978.
[11]Department of Regional Economic Expansion. *The Canada Land Inventory: Objectives, Scope, Organization. Report No. 1.* Ottawa: Department of Regional Economic Expansion, 1970, p. 14, 49-51.

A critical component of the CLI was the development of a computerized data storage, processing and retrieval system. The resultant Canada Geographic Information Systems (CGIS)[12] became fully operational in 1972. This system is capable of manipulating any data with characteristics similar to those of the CLI; that is, map data composed of closed polygons. Map data can be input at scales of 1:370 to 1:1,000,000 using the Universal Transverse Mercator projection.

Although FARINEO did not make use of CGIS, the following land use mapping projects have: Regional Municipality of Niagara (Agriculture Canada and OMAF, 1980), South West Ontario Rural Land Inventory (Environment Canada and OMAF, 1981-2)

In 1975, Agriculture Canada[13] initiated a new approach to land use mapping. Under the direction of the Land Resource Research Institute, a field inventory of agricultural land use was conducted in Nepean and Gloucester in the rural-urban fringe of Ottawa. This area was mapped primarily using field reconnaissance to inventory the specific use of every field. The legend used for the survey was a list of identifiers for various crops. Since this was an inventory of the use of each field, this legend was all that was required.

Agricultural uses identified were: orchards, market gardens, sod farms, nurseries, flowers, non-owner used garden plots, and field crops identified as corn, small grains, soybeans, hay, pasture and fields used as summer fallow.

One of the major limitations of this pilot study was the static nature of the maps. Regular agricultural rotational practices would change the land use of many fields with each growing season, thus making the maps obsolete in subsequent years. This limitation was recognized by Agriculture Canada. In 1977, when the rest of the Regional Municipality of Ottawa-Carleton was mapped, the agricultural land use systems approach was introduced.[14] The aim was to produce a map which would remain valid over time. To do this, agricultural land uses were grouped to form agricultural land use systems identifying the crop rotations on each parcel of agricultural land. Within each crop rotation, the mix and the proportion of crops usually remain the same year after year. The only change is the rotation of the fields in which the crops are grown. Thus, in looking at a system three years after the initial inventory, one would expect to find the same mix and proportion of crops in the parcel, but the crops would be grown in different fields. In Eastern Ontario, patterns of continuous monoculture and a variety of crop rotations were found. Six agricultural land use systems were derived from these patterns. The mix of crops grown and the proportion of each crop within each rotation contributed to the identification of these systems:

Ottawa-Carleton Legend:

Monoculture System	a single intensive or cash crop type, usually corn; identified by large fields and no fencerows.
Corn System	25-80% corn mixed with hay or grain, with 10% pasture
*Mixed System	a traditional system of a hay, grain and corn combination with less than 25% corn and less than 15% pasture
*Hay System	hay, grain combination with less than 10% corn and less than 15% pasture
Pasture System	hay and pasture with little rotation.
Grazing System	grazing land or pasture, with less than 15% hay; low intensity use usually on poor land.

Using air photo analysis techniques, systems were pre-typed by combining the fields which showed uniform patterns, tones and textures. These pre-typed systems were then verified by ground checks. The Ottawa-Carleton inventory used land tenure patterns as map units, so that each property was given a land use systems designation. This land use classification scheme was adopted for use with FARINEO since the agricultural activity in the FARINEO area was considered to be essentially the same as that in Ottawa-Carleton. The mix of crops remained the same within each system of the FARINEO legend, but in the Corn and Mixed systems, the proportions of these crops were changed:

[12]Ibid, pp. 10-13.
[13]Soil Research Institute, Agriculture Canada. "Land Use Mapping". Ottawa, 1977. (Mimeographed)
[14]Ibid., p. 5-12.

FARINEO Legend:

Monoculture System	a single intensive or cash crop type, usually corn. Fields have been in continuous corn or continuous grain. Very large fields, no fencerows.
Corn System	corn, grain and hay combination, with corn 40-75%. Some pasture is allowed.
Mixed System	grain, corn and hay combination, with no dominant crop. Corn should be less than 40%, some pasture is allowed.
Hay System	hay and grain combination, with hay dominant. Some pasture and less than 10% corn is allowed.
Pasture System	hay and pasture system with improved (cultivated) pasture.
Grazing System	grazing land of natural grasses. Low intensity use, usually on poorer land.

These systems were pre-typed in the same manner as with the Ottawa-Carleton survey. The major difference between the two surveys was the selection of the map unit. Whereas the Ottawa-Carleton survey utilized the land tenure pattern for mapping, the FARINEO inventory used 100-acre land parcels. Accordingly, each 100-acre unit was given a land use designation. Mapping guidelines ensured consistency in the mapping of these land use systems.

The key difference between the FARINEO corn and mixed systems is the scale and intensity of the farm operation. The dominant crop is corn in corn systems, while mixed systems are usually characterized by equal proportions of hay, grain and corn. Another basic difference between these two systems is the size of the fields and the farm operation. Corn systems have larger fields than mixed systems. Evidence of cash cropping with grain corn is more prevalent in corn systems whereas silage corn is grown in the mixed.

The other distinction to be made is between hay, pasture and grazing systems. Hay systems have productive stands of hay, some fields of grain and regularly improved pasture. There may also be small acreages of corn. Productivity of the land is maintained by a regular rotation scheme which includes grain and hay which is reseeded every four or five years. This good quality hay is usually harvested as haylage or dry hay, or it may be pastured in late July or August as second or third crop pasture.

The pasture system is usually made up of a close association of small fields of hay and pasture used for the same crop every year. The hay tends to be traditional grasses (Timothy, Brome) and may not have been cut in the past year, but has been cut in the past two or three years. This system also includes some poor quality pasture.

The grazing system is comprised entirely of fields of natural or improved pasture with clumps of trees, rock outcrops or low, wet or swampy areas.[15]

Orchards, market gardens, nurseries and greenhouses were classified as special agriculture.

The non-agricultural land uses designated by FARINEO were also adopted from the 1977 land use survey of Ottawa-Carleton:

Idle Agricultural Land (A1)	Land idle for 1-10 years. Fields are overgrown with weeds and native grasses with an understory of similar material in a state of decay. Fencelines may be in poor condition or not visible. In advanced stages there may be scattered clumps of willows or small poplars or alders. Most woody growth has spread out from the fencelines and occurs in depressions, leaving central, higher areas covered with weeds. This land could be returned to agriculture with a minimum of capital input.
Idle Agricultural Land (A2)	Land idle for more than 10 years, characterized by brush, shrubs and poplar growth between five and twenty-five feet high over more than thirty percent of the total area. Slower growing trees such as cedar, elm, cherry, apple or maple may be scattered but well established. The presence of even a few of these species indicates that the land has been left undisturbed for a lengthy period of time. Later stages evidence the plant community conforming to natural landform and soil conditions, covering fences and ditches. Substantial investment and equipment would be required to return the land to agriculture.

[15]Food Land Development Branch. "Reference Information re the Forestry Agricultural Resource Inventory of Eastern Ontario", Toronto: April 1980, (Mimeographed), pp. 21-22.

Woodland	Continuous forest cover, with trees more than twenty-five feet high and with a minimum of forty-five percent crown closure density. Area not to be less than half a hectare.
Pasture Woodland	Woodlands used for grazing livestock
Reforestation	Land supporting a stand of artificially stocked trees, either by hand or machine
Swamp, Marsh	Natural depressional areas which are waterlogged for most of the year and may encompass small ponds of standing water. Early successional stage species such as cattails, reeds, sedges and willows are prevalent. These areas have no recognizable active use.
Built-up	Urban related uses including continuous ribbon development. Single rural residential lots were not identified unless in groups of five or six located adjacent to each other.
Extraction	1) Sand and gravel pits and quarries, or 2) Topsoil removal including areas where topsoil is stock-piled in windrows.
Sod Farms	Public and commercial sales of sod.
Recreation	Facilities open for recreational use (playgrounds, playing fields, parks, golf courses). Recreation areas within built-up areas were not designated.

FARINEO is more than an agricultural land use inventory; it is also an inventory of forest lands, tile and municipal drainage, and farm buildings. This resource information was then related to the soil capability for agriculture (CLI) to show how the soil resource is being used. By relating the FARINEO information to the soils, the inventory provides a useful basis for making land-related decisions and developing agricultural land use policy in Eastern Ontario.

Agricultural land use inventories are also being conducted in other areas of the province. The Regional Municipality of Niagara (field work 1980); the Avon watershed near Stratford (field work 1980), and the counties of Perth, Middlesex, Oxford, Elgin and Kent (Southwestern Ontario Rural Land Inventory — field work 1981 and 1982) are areas which have been and are being inventoried in addition to the Regional Municipality of Ottawa-Carleton and the FARINEO area. New Brunswick and Nova Scotia have inventories in place, and preliminary work has been carried out in a portion of southern Saskatchewan to show the usefulness of this inventory technique.

The inventories conducted by Agriculture Canada in the Regional Municipalities of Ottawa-Carleton and Niagara and in southern Saskatchewan, and by Environment Canada in the Avon watershed had a questionnaire component which was not carried through in FARINEO or the Southwestern Ontario Rural Land Inventory (SWORLI). The questionnaire was administered to a random selection of farmers representing the various agricultural land use systems to obtain information about the economic aspects of each system. The results of the Agriculture Canada questionnaire surveys were analysed by computer and are available from the Land Resource Research Institute of Agriculture Canada in Ottawa.

3
THE EASTERN ONTARIO SCENARIO

Agriculture and forestry have been closely linked in Eastern Ontario since pioneer days. Agriculture first developed to supply food for the lumber camps which were established in the upper Ottawa Valley. Because the Canadian Shield effectively separates this market from other agricultural areas of the province, mixed farming developed. The depletion of the timber stands eventually reduced the market for agricultural products from Eastern Ontario. Mixed farming was replaced by livestock production, primarily dairying due to the influence of the cheese and dairy industries in New England and New York State.[16]

3.1 THE AGRICULTURAL SCENARIO

3.1.1 Physiography

The six counties of Eastern Ontario included in the FARINEO area are part of the St. Lawrence Lowlands, an area underlain by flat-lying, gently warped Paleozoic strata. The Canadian Shield borders this area to the north and west. To the south and east lie the Appalachian Mountains. The physiography of the area is largely a result of glacial action during the last (Pleistocene) Ice Age.

Sands, clays and loams are interspersed throughout the area (Figure 3). On the western edge are limestone plains overlaid by shallow soils. In this area surface stoniness is common and drainage is often impeded, delaying seeding. In the summer, however, the soils tend to be droughty. On the sand plains drainage is poor due to the closeness of the water table to the surface. In addition, fertility is low.

Clay soils make up a large part of the area. These soils are also imperfectly or poorly drained. When drainage is improved, however, they are excellent soils for agriculture.

Despite the drainage limitation to the soils of Eastern Ontario (Table 2), this is part of one of the agriculturally significant regions of Ontario — the St. Lawrence Lowlands. The most prevalent agricultural activity in the area is dairying.[17]

Table 2
DRAINAGE CLASSIFICATION OF SOILS IN THE FARINEO AREA

	Well Drained	Imperfect	Poor	Very Poor
Dundas	10.0%	32.0%	36.0%	22.0%
Glengarry	43.0	7.0	36.0	14.0
Grenville	24.6	35.8	34.2	5.4
Prescott & Russell	20.5	26.0	53.5	—
Stormont	42.8	16.7	20.5	20.0

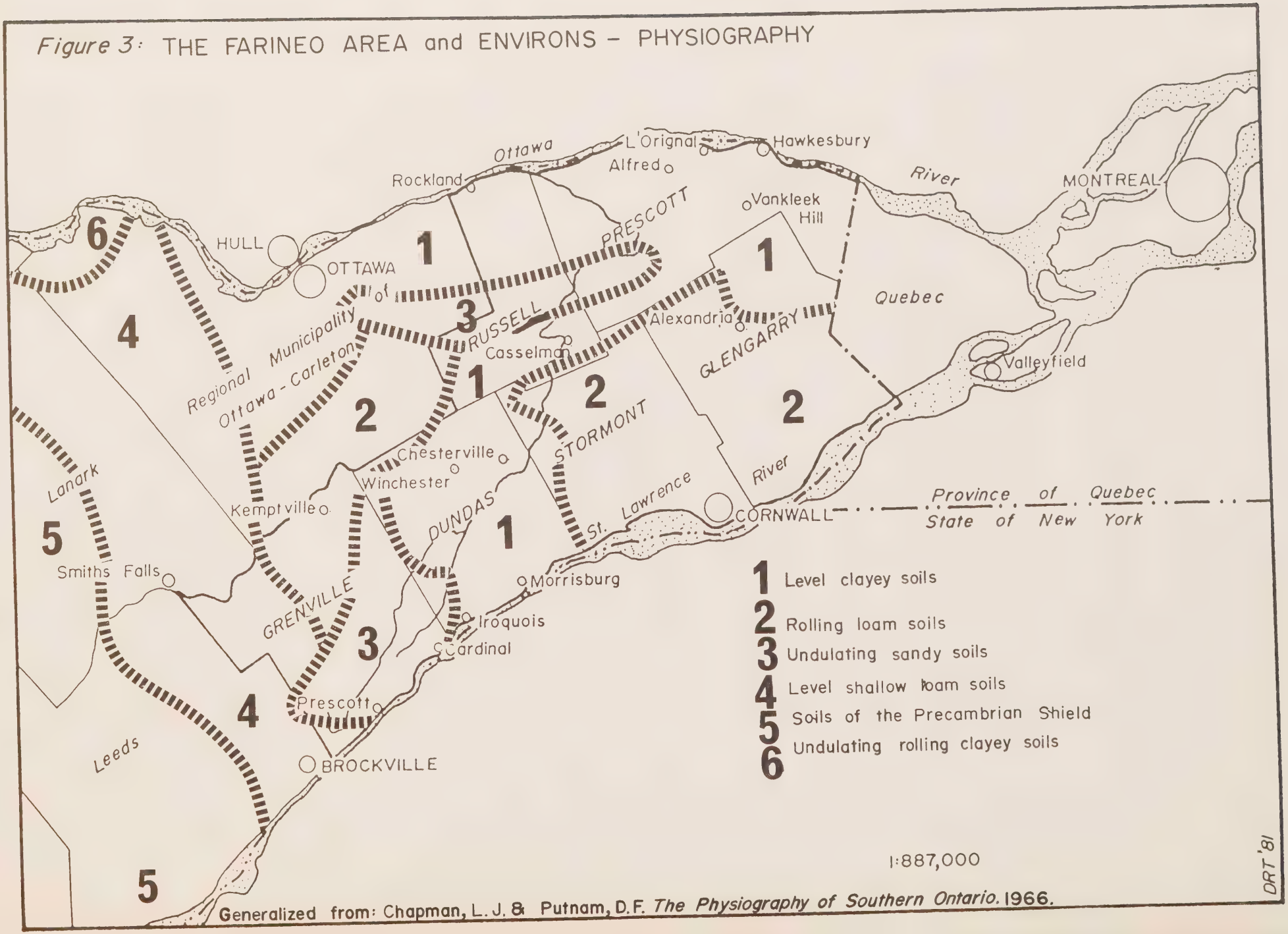
Source: R.E. Wicklund & N.R. Richards, *Soil Survey of Russell & Prescott Counties.* Guelph: Research Branch, Canada Dept. of Agriculture, 1962, p. 39; B.C. Matthews & N.R. Richards, *Soil Survey of Dundas County.* Guelph: Experimental Farms Service, Canada Dept. of Agriculture, 1952, p. 80; N.R. Richards, B.C. Matthews and F.F. Morwick, *Soil Survey of Grenville County.* Guelph: Experimental Farms Service, Dominion Department of Agriculture, 1949, p. 13; N.R. Richards. *Soil Survey of Stormont County.* Guelph: Experimental Farm Service, Dominion Dept. of Agriculture, 1954, p. 17, B.C. Matthews, N.R. Richards and R.E. Wicklund, *Soil Survey of Glengarry County.* Guelph: Experimental Farms Service, Canada Dept. of Agriculture and the Ontario Agricultural College, 1957, p.18-19.

3.1.2 Climate

Climate is the sum of past weather experiences. The conditions of temperature, moisture and light combine to create the observed climate conditions. In many respects, the climate of Eastern Ontario resembles the

[16]J. Spelt. "Southern Ontario" in J. Warkentin (ed) *Canada: A Geographical Interpretation.* Toronto: Methuen, 1968, p. 379.
[17]L.J. Chapman & F.D. Putnam. *The Physiography of Southern Ontario.* 2nd Edition. Toronto: University of Toronto Press, 1966, pp. 345-362.

Figure 3: THE FARINEO AREA and ENVIRONS – PHYSIOGRAPHY



Generalized from: Chapman, L. J. & Putnam, D. F. *The Physiography of Southern Ontario.* 1966.

climate of the southern Georgian Bay area, especially Simcoe and Bruce counties and the northern part of Perth, Grey and York.

Temperature is an important component of climate. Each plant species grows within a limited temperature range. Optimum growth occurs at some specific temperature within this range. An understanding of the temperature regime is necessary to determine what crops may be grown, and the optimum dates for sowing and harvesting.

Figures 4-7 show the mean daily temperature isotherms for each season. Eastern Ontario experiences the same temperatures as the southern Georgian Bay area in three seasons (spring, summer and fall). Winters are colder in Eastern Ontario, which prevents farmers from growing winter wheat.

The start of the growing season (average date when the mean temperature rises above 5.6°C (42°F)) occurs at the same time in both the Eastern and the southern Georgian Bay areas (Figure 8). Figure 9 illustrates that the close of the growing season also occurs at the same time for both areas.

With these similarities between the two areas — temperature and growing season — it is not surprising to see in Figure 10 that both areas have the same number of heat units available for corn production. Corn heat units (CHU) are used to describe the suitability of geographic regions for growing various hybrid varieties of corn. Since plant development varies with temperature, CHU are based on the relationship between temperature and the rate of maturity of corn. Areas which are farther from the Great Lakes, or are higher in elevation, or both, will have a lower CHU rating (less suitability for growing corn) than areas which are close to the Lakes or are lower in elevation.[18]

Precipitation in Eastern Ontario does not vary greatly from that of the Bruce-Huron area (Figure 11). However, because the Eastern Ontario soils have drainage limitations and because of the relatively flat topography, the area is prone to flooding during spring runoff and periods of heavy local rainfall during the growing season.

3.1.3 The South Nation River

The drainage outlet for 391,356 hectares (967,050 acres) of the FARINEO area is the South Nation River, which flows northeasterly for 160 kilometers from Brockville to the Ottawa River near Plantagenet. Occasionally during the spring thaw the river has flooded up to 14,200 hectares (35,000 acres) of land. Certain portions of the river have also experienced summer floods as a result of heavy local storms.[19]

The South Nation River Basin Study was launched to "identify and develop strategies to enhance the economic conditions in the basin through integrated management of water, land and other resources".[20]

Since agriculture is an important industry in the watershed, it was necessary to incorporate detailed information on the agricultural land use into the basin study. The FARINEO inventory was initiated to provide this detailed agricultural information.

3.1.4 Location — Distance to Markets

Urban development in Southern Ontario since the turn of the century has resulted in the growth of a large urban complex centred around Toronto and extending westward around the western tip of Lake Ontario. In Eastern Ontario urban growth has not been as pronounced in spite of efforts by the provincial government to encourage development in this area.

Manufacturing has not developed in Eastern Ontario, so there has not been significant urbanization and population growth. With the exception of Ottawa, there are few large urban centres. In recent years, government funds have been used in Cornwall to help develop employment opportunities through the industrial and commercial growth of the city.

The absence of a large market close by and the distance of Eastern Ontario from the heavily populated areas of Southern Ontario have left the region relatively isolated from the major Ontario markets (Figure 12).

[18]D.M. Brown, G.A. McKay and L.J. Chapman, *The Climate of Southern Ontario.* Toronto: Environment Canada, Atmospheric Environment Service, Climatological Studies No. 5, 1980, pp. 15-39, and D.M. Brown, "Heat Units for Corn in Southern Ontario", Toronto: Ontario Ministry of Agriculture and Food, Factsheet, 1978, p. 1.
[19]J.W. McCullough, "An Overview of Eastern Ontario Agriculture" in Ontario Regional Committee, *Working Towards a Future — Eastern Ontario Workshop Report, October 19-21, 1977, Perth, Ontario.* Ottawa: Canadian Council on Rural Development, Jan. 1978, p. 101.
[20]South Nation River Conservation Authority. "Terms of Reference for the Agricultural Component Background Study", April, 1980 (mimeographed), p. 1.

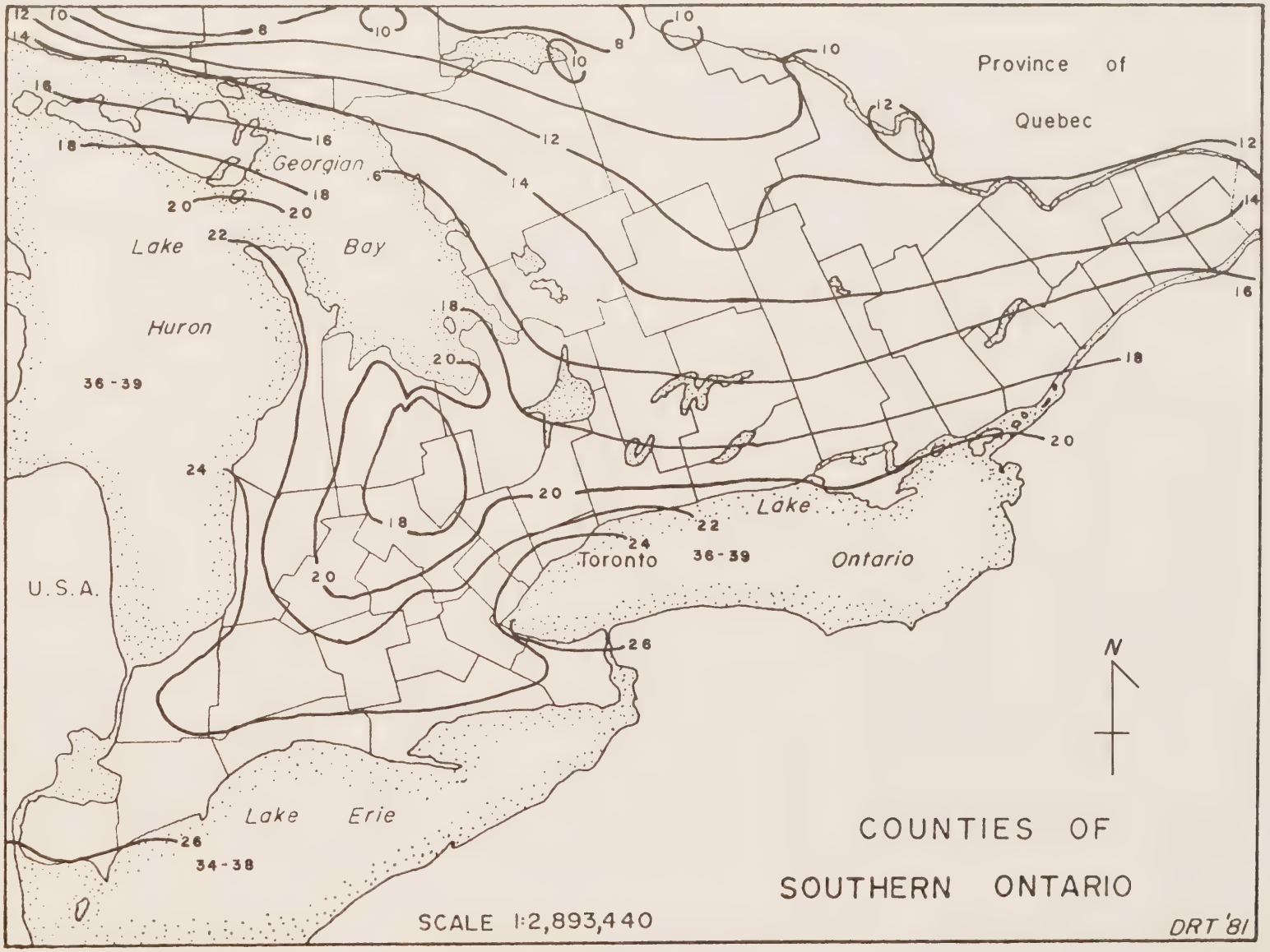


Figure 4: Mean Daily Temperature (°F) for January

SOURCE: BROWN, D. M., McKAY, G. A. & CHAPMAN, L. J. *THE CLIMATE OF SOUTHERN ONTARIO.* TORONTO: ENVIRONMENT CANADA, ATMOSPHERIC ENVIRONMENT SERVICE, P. 21.

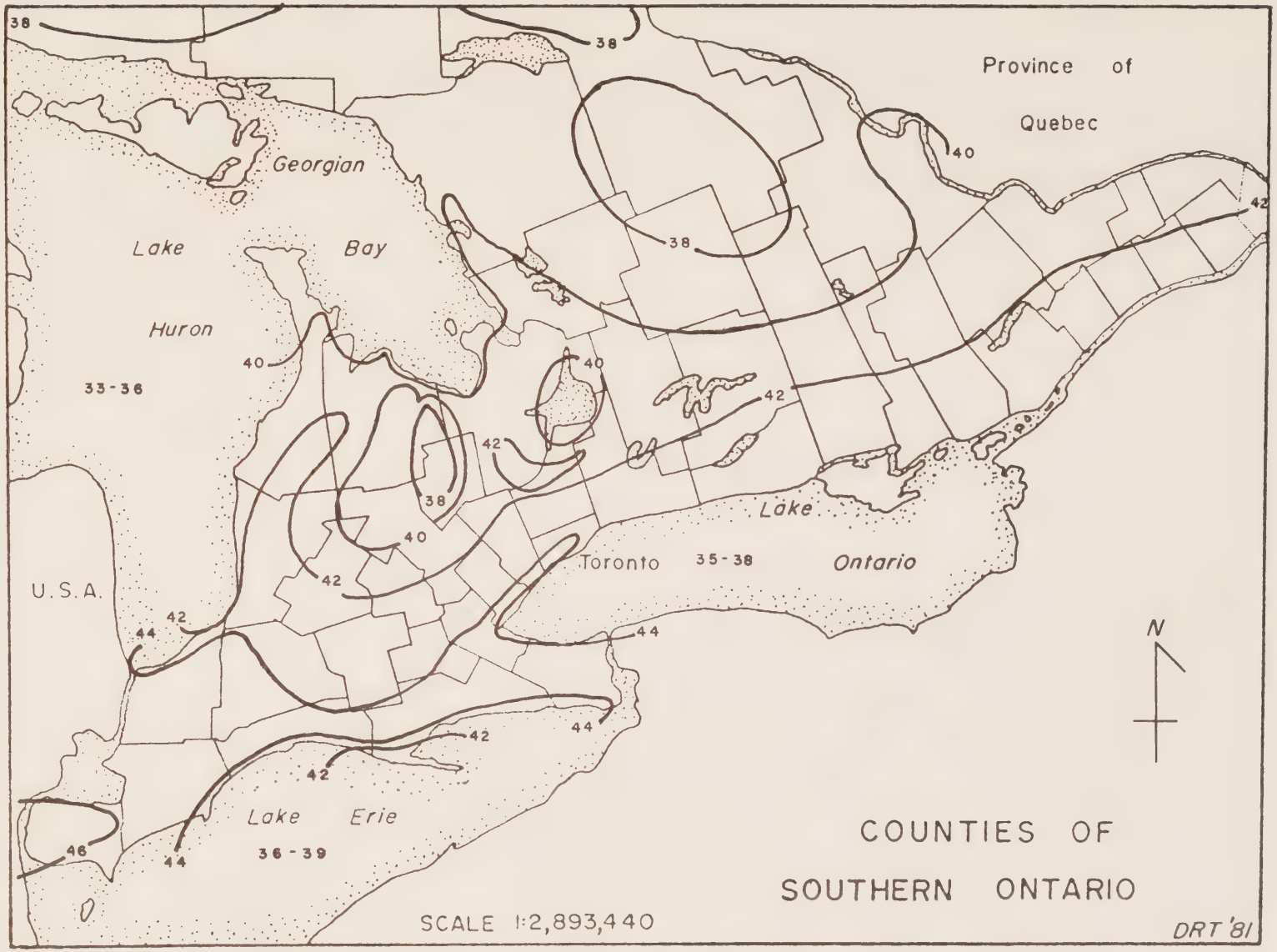


Figure 5: Mean Daily Temperature (°F) for April

SOURCE: BROWN, McKAY & CHAPMAN. *THE CLIMATE OF SOUTHERN ONTARIO*. P. 21.

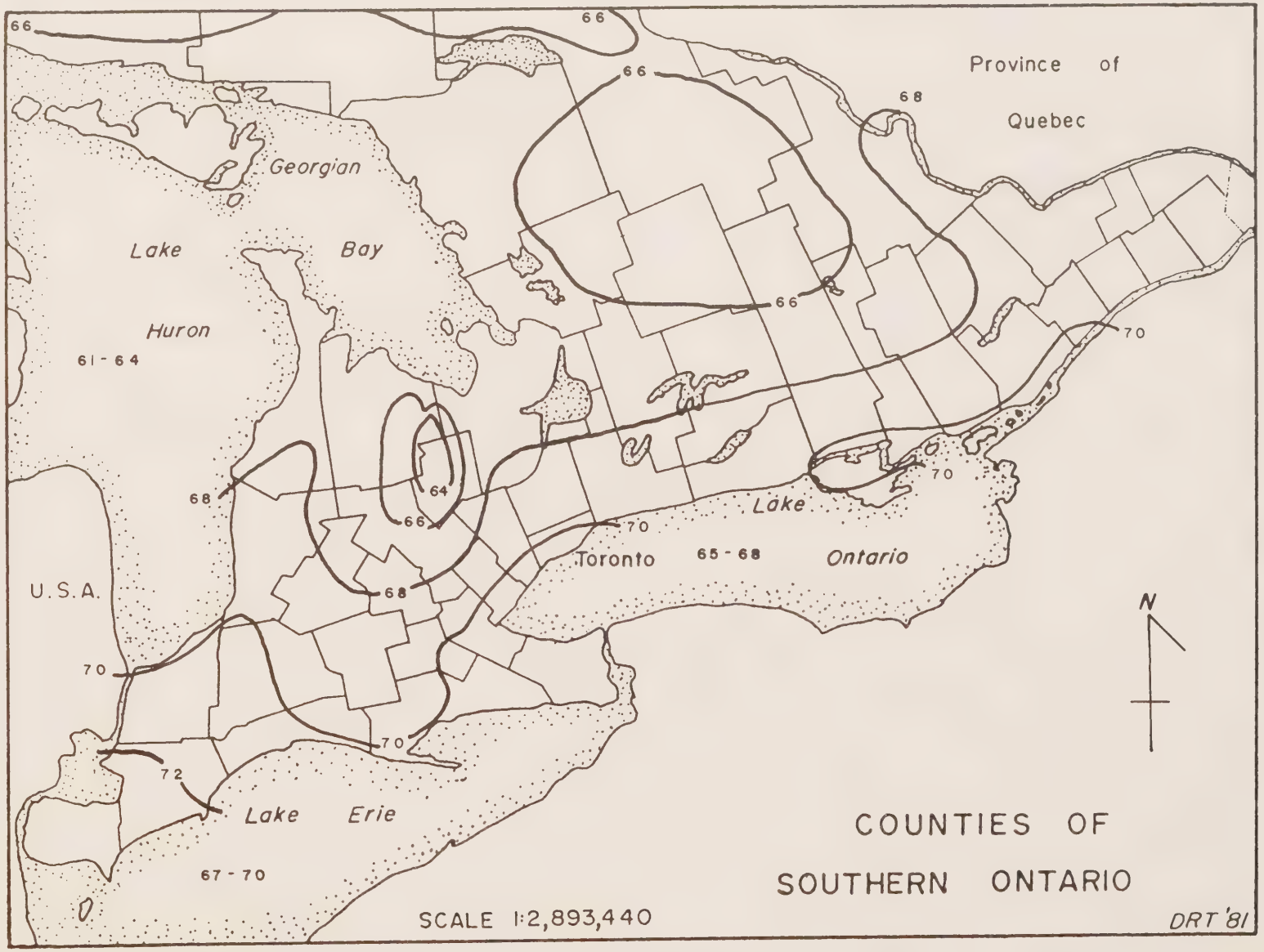


Figure 6: Mean Daily Temperature (°F) for July

SOURCE: BROWN, D.M., McKAY, G.A. & CHAPMAN, L.J. *THE CLIMATE OF SOUTHERN ONTARIO*. TORONTO: ENVIRONMENT CANADA, ATMOSPHERIC ENVIRONMENT SERVICE, 1980, P.22.

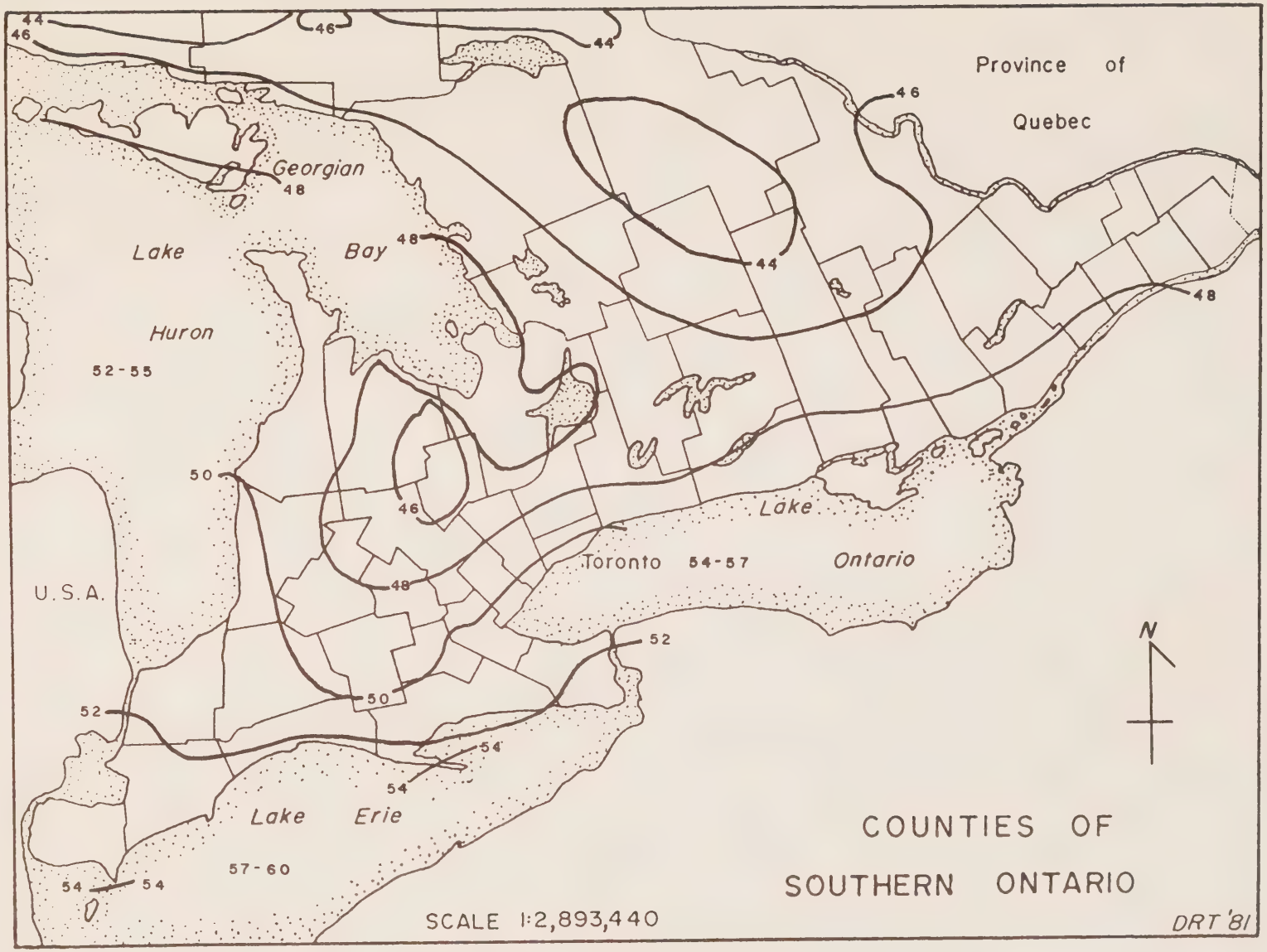


Figure 7: Mean Daily Temperature (°F) for October

SOURCE: BROWN, D. M., McKAY, G. A., & CHAPMAN, L. J. *THE CLIMATE OF SOUTHERN ONTARIO.* TORONTO: ENVIRONMENT CANADA, ATMOSPHERIC ENVIRONMENT SERVICE, 1980, P. 22.

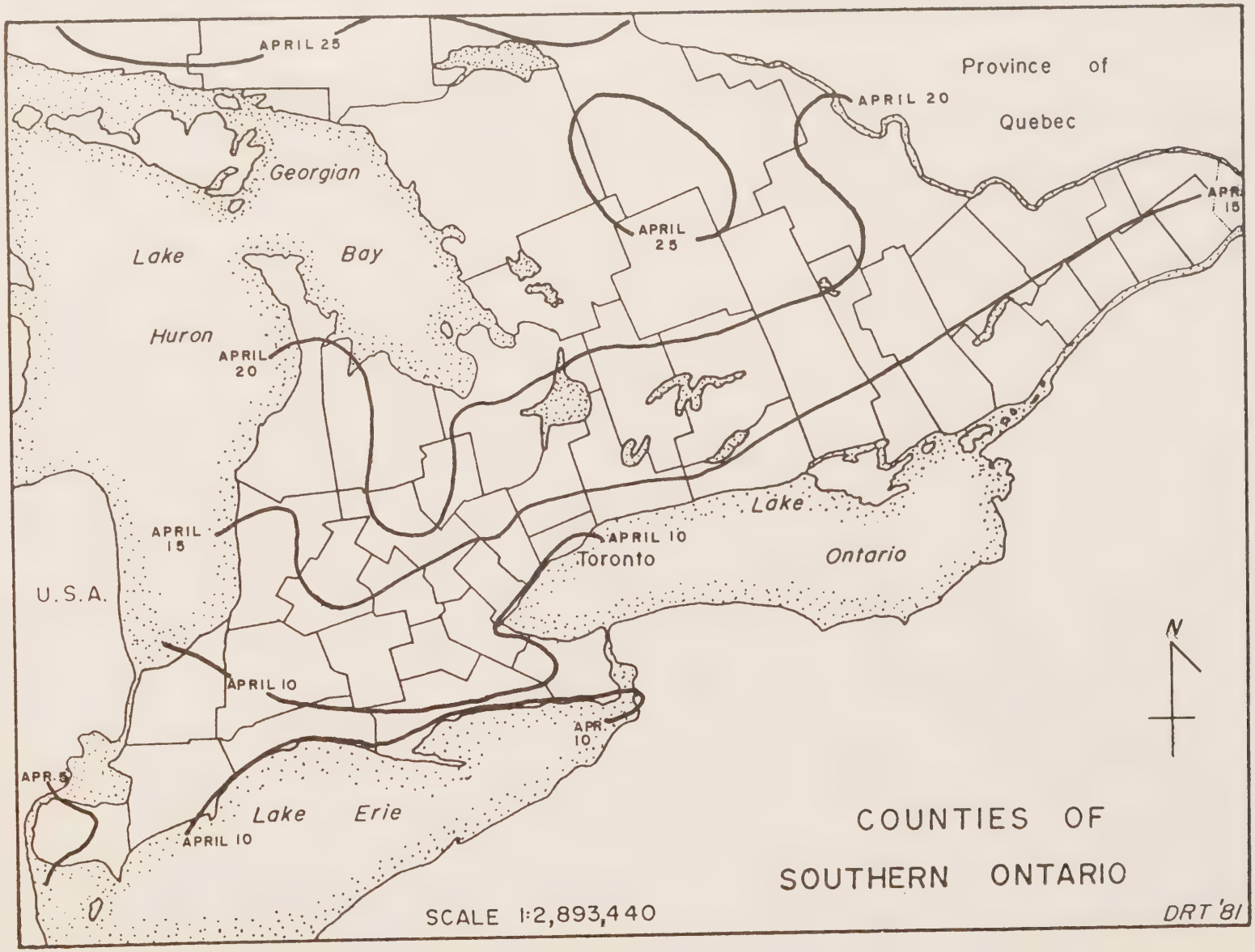


Figure 8: Start of Growing Season

SOURCE: BROWN, McKAY & CHAPMAN. *THE CLIMATE OF SOUTHERN ONTARIO, P. 35.*

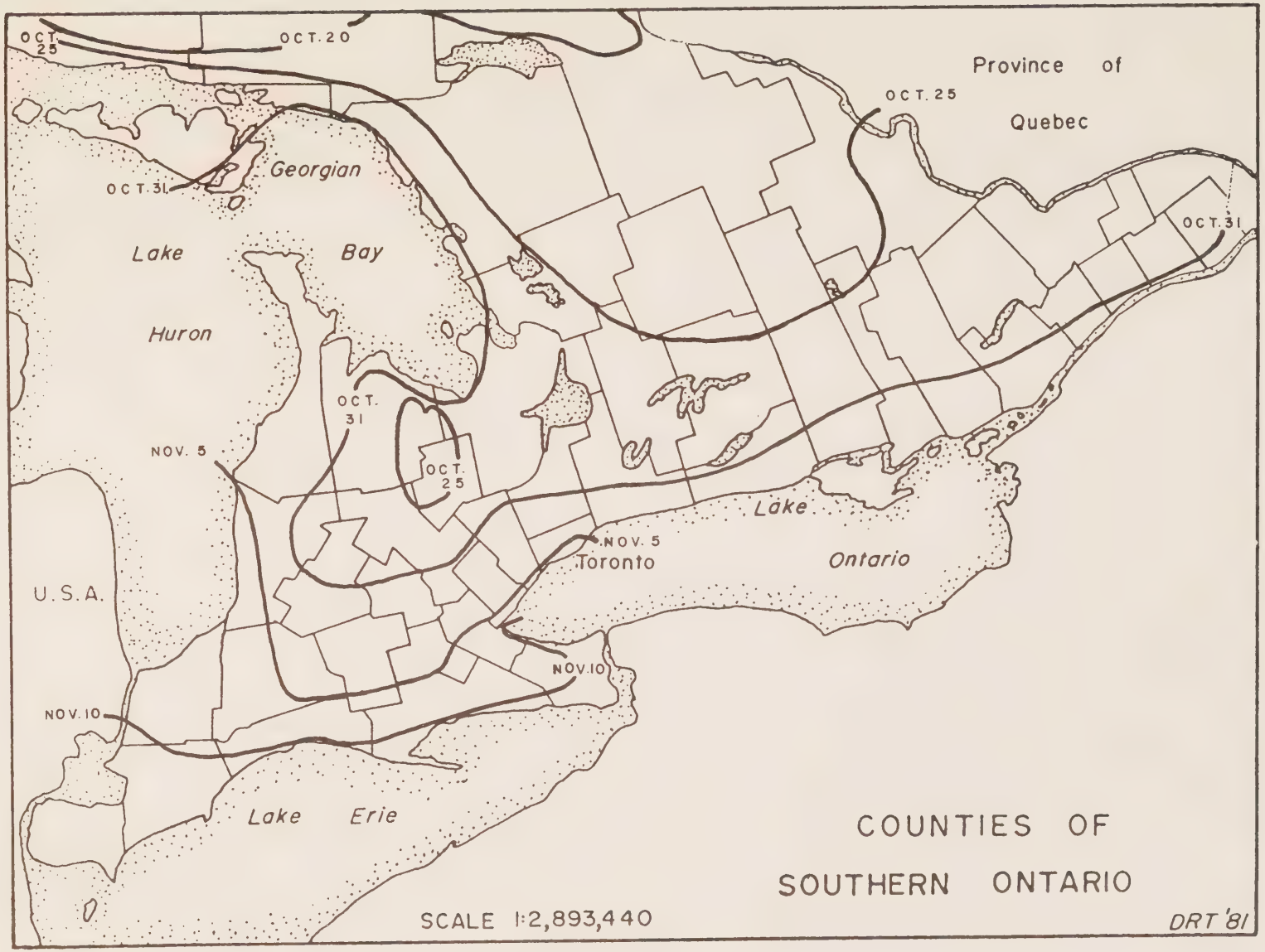


Figure 9: End of Growing Season

SOURCE: BROWN, McKAY, & CHAPMAN. *THE CLIMATE OF SOUTHERN ONTARIO.* P. 35.

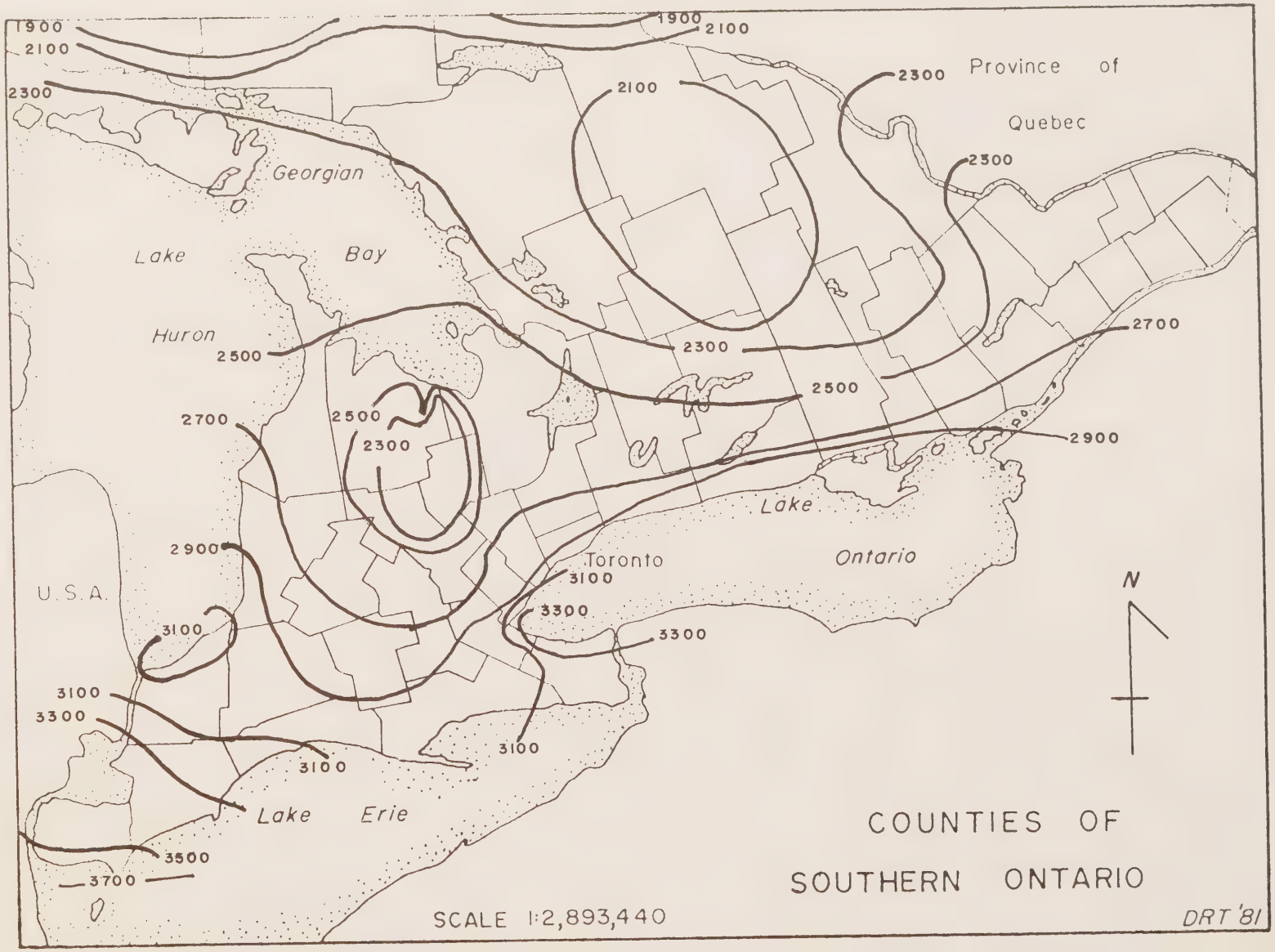


Figure 10: **Mean Annual Heat Units for Corn**

SOURCE: BROWN, D. M., McKAY, G. A. & CHAPMAN, L. J. *THE CLIMATE OF SOUTHERN ONTARIO.* TORONTO: ENVIRONMENT CANADA, ATMOSPHERIC ENVIRONMENT SERVICE, 1980, P. 38.

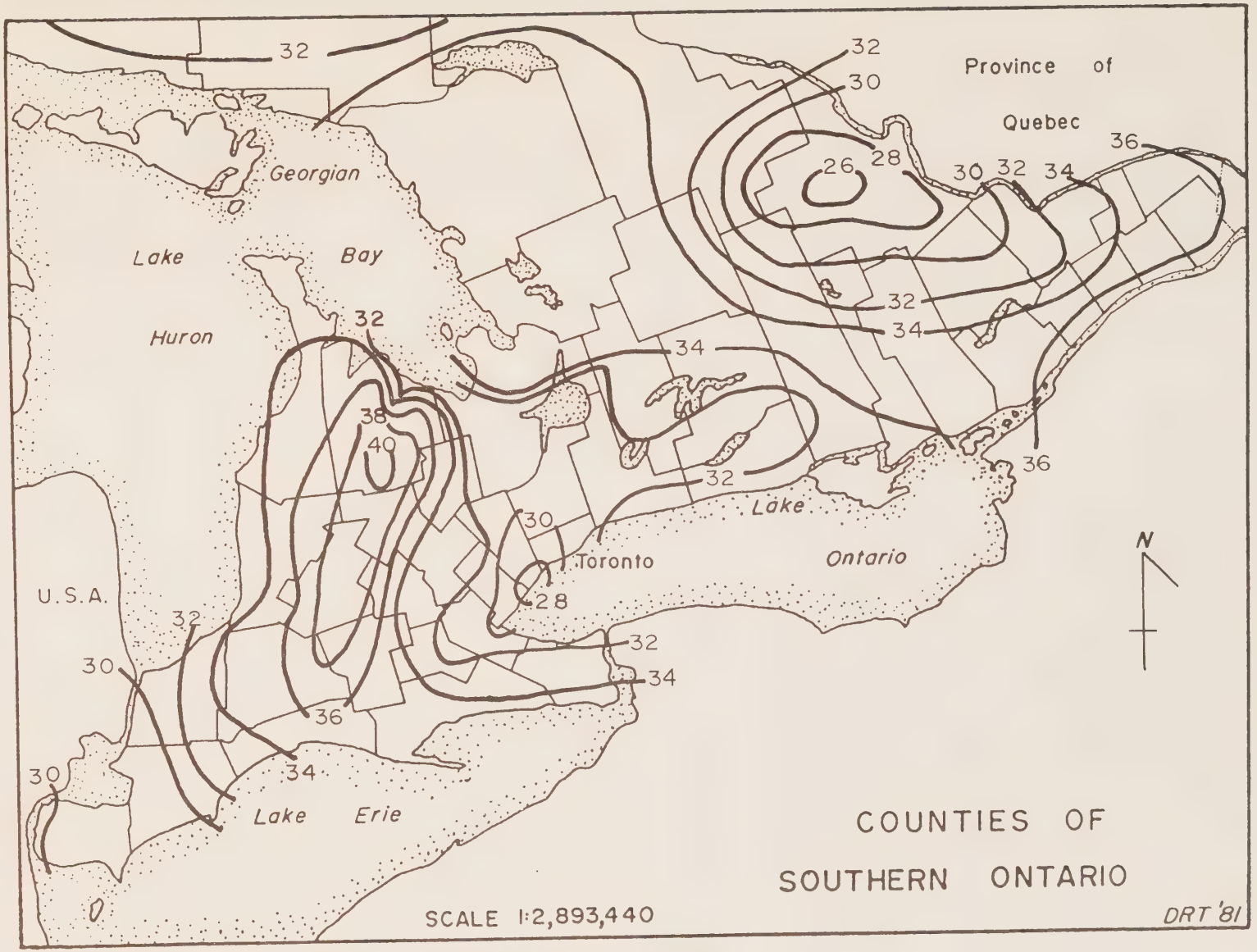


Figure 11: Mean Annual Precipitation (Inches)

SOURCE: BROWN, McKAY & CHAPMAN. *THE CLIMATE OF SOUTHERN ONTARIO.* P. 40.

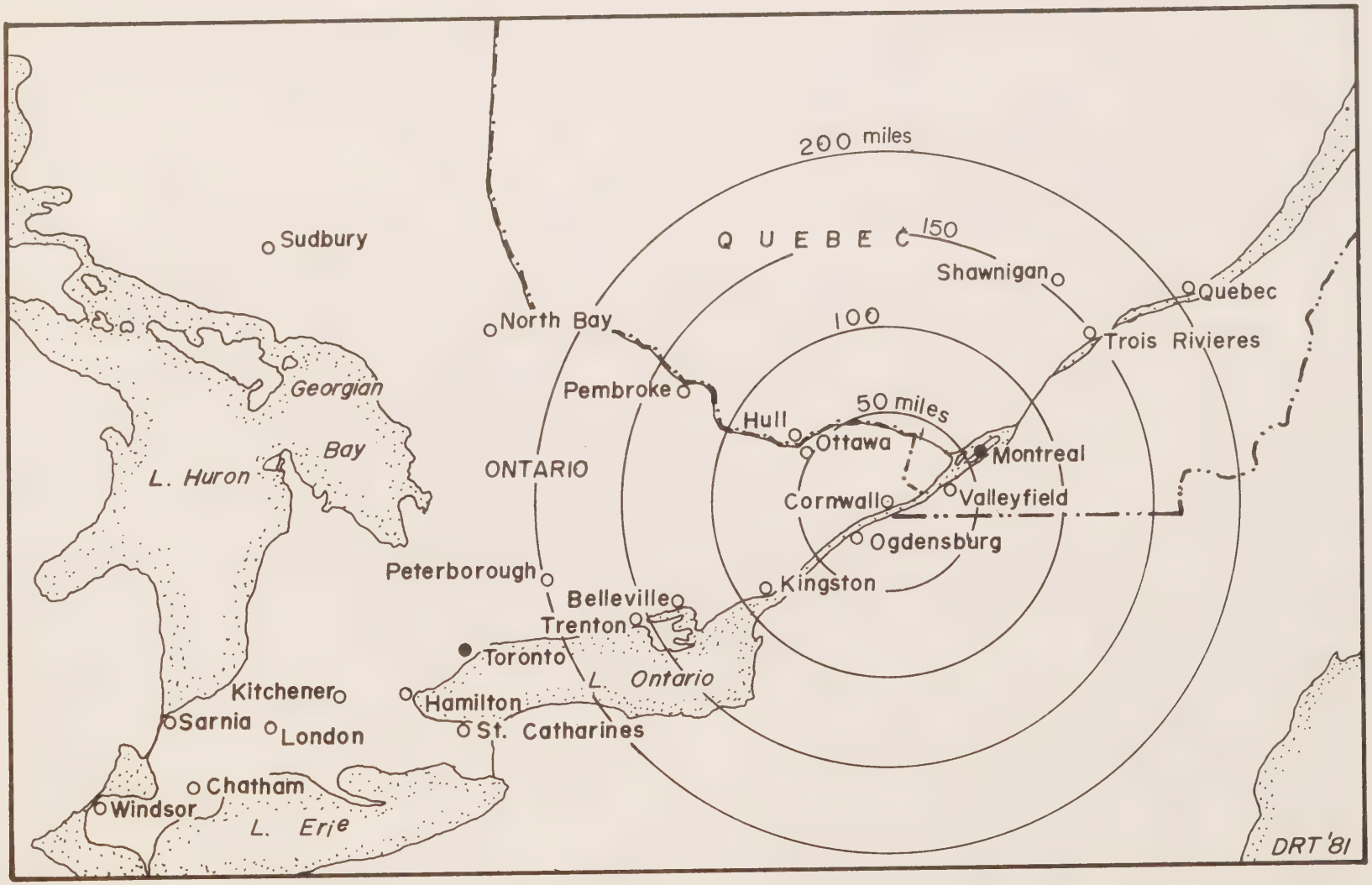


Figure 12: DISTANCE TO MARKETS

1:5,760,000

0 50 100 200 miles

N

3.2 THE FORESTRY SCENARIO

There are two large pulp and paper mills in Eastern Ontario, one located at Cornwall and the other at Hawkesbury. As much as 70% of the wood used by these mills comes from outside Ontario, and only 15% of the wood used is obtained within a fifty mile radius of each mill.[21] This situation has led to the re-examination of the forest industry in Eastern Ontario.

There is renewed interest in strengthening the forest industry in Eastern Ontario for a number of reasons. Eastern Ontario forests have a growth advantage over Northern Ontario forests, having deeper soils and more available heat units. Unlike Northern Ontario, Eastern Ontario is serviced by a well-developed road network. This makes the forest stands easily accessible, which reduces the cost of harvesting. Another major difference is that in Eastern Ontario there exists a significant amount of marginal agricultural land. This land has a great potential for forest production, especially new fast-growing varieties of poplar. By using this land for forest production, transportation costs associated with shipping raw materials to the pulp mills could also be reduced. Finally, there is a readily available skilled work force in Eastern Ontario.

To strengthen the forestry industry in Eastern Ontario, a program was initiated in 1978 to enable MNR to accelerate development programs in this area. The program, New Forests in Eastern Ontario, was made up of five components.[22]

The first component, the forestry and agricultural resource inventory — the land use survey — identified and located underutilized or idle land in the area. This is an integral part of the New Forests program, since this information allows an assessment to be made of the suitability and availability of these areas to produce the new hybrid poplar varieties. The second component involves the harvesting of poor quality hardwood trees to provide more growing space for better quality trees in the Eastern Ontario forests.

The last three components involve developing hybrid poplar varieties for introduction into the forestry industry to supply wood to the mills. This project includes hybrid poplar development and research, and the establishment of a hybrid poplar nursery for the production of poplar varieties of high genetic quality.

[21]P. Anslow, "The Forestry Situation in Eastern Ontario" in Ontario Regional Committee. *Working Towards a Future — Eastern Ontario Workshop Report, October 19-21, 1977, Perth, Ontario.* Ottawa: Canadian Council on Rural Development, January 1978, p. 108.

[22]Amendment No. 1. "Canada-Ontario Subsidiary Agreement. Community and Rural Resource Development under the General Development Agreement." June 21, 1978 (Mimeographed), p. 1.

4
METHODOLOGY

The complete inventory is composed of a series of five data overlays:
1. Agricultural and Non-Agricultural Land Uses
2. Forest Lands
3. Tile and Municipal Drainage
4. Soil Capability for Agriculture (Canada Land Inventory)
5. Farm Building Codes

The forest lands and agricultural and non-agricultural land use systems were inventoried first. At the same time, each set of farm buildings was coded. Later, a separate drainage inventory was undertaken. The Canada Land Inventory (CLI) soil capability for agriculture maps, an existing source of information, was also included as part of the FARINEO inventory.

Students with expertise in land use mapping in their final year or graduates of a College of Agricultural Technology and senior community college or university forestry students were hired to make up field teams. Each team consisted of an agriculturalist who inventoried land uses and farm buildings, and a forester who inventoried forest stands and woodlots. Complete townships were assigned to each agriculturalist to inventory, while the foresters took turns with different crews to minimize error and maintain consistency among the teams. The surveyors discussed their progress and compared notes to further ensure mapping consistency.

Working out of the OMAF Extension Branch office in Embrun in 1978, the townships of Finch, Cambridge and Osnabruck were inventoried. Teams were based at the MNR station at Bourget in 1979, when the following townships were inventoried: Alfred, Caledonia, Clarence, Cornwall, East Hawkesbury, West Hawkesbury, Longueuil, North Plantagenet, South Plantagenet, Roxborough, Russell, and Winchester.

In 1980 the inventory teams worked out of the OMAF Extension Branch Office at Alexandria and the Agricultural Engineering Section of the College of Agricultural Technology in Kemptville, when the balance of the area was inventoried: Augusta, Charlottenburgh, Edwardsburgh, South Gower, Kenyon, Lancaster, Lochiel, Matilda, Mountain, Oxford-on-Rideau, Williamsburgh and Wolford Townships. As well, Finch, Cambridge and Osnabruck Townships were inventoried again.

4.1 LAND USE

The methodology utilized in implementing this inventory was developed by the Land Resource Research Institute of Agriculture Canada. The technique combines the interpretation of recent aerial photos with field reconnaisance.[23]

Photo coverage was obtained for each township mapped in 1978-1979 using 1975 air photos at 1:36,000 scale. Townships mapped in 1980 used 1979 photos at a scale of 1:30,000. These are good scales to work with since the number of photos per township is manageable.

4.1.1 Photo Preparation

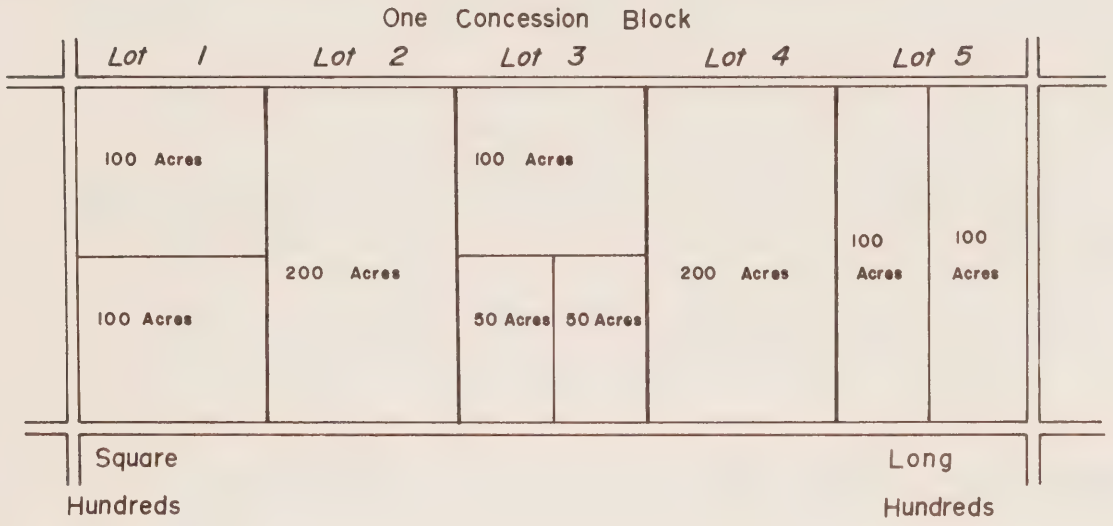
The photos were first arranged to create a photo mosaic for each township with an overlap of not less than thirty percent. A sheet of mylar was then overlaid on each photo. Referring to the National Topographic Service (NTS) 1:50,000 scale map sheets, township boundaries were marked on the mylars. The area to be mapped on each photo was then outlined to ensure total coverage of each township. Each photo was then referenced to the adjacent photos using photo numbers. With this work completed, the photos were ready for mapping.

[23]Soil Research Institute of Agriculture Canada. "Land Use Mapping". Ottawa, 1977 (Mimeographed) pp. 5-22

4.1.2 Pre-Typing

The photos were first mapped or "pre-typed" using air photo interpretation to identify recognizable features. Unlike the Ottawa-Carleton survey which used the ownership pattern to determine map units, the FARINEO survey employed hundred-acre parcels based on the lot and concession grid of each township. The first step, then, was to transfer the lot and concession fabric of the townships onto the photos. The Ontario Land Survey divided concession blocks into lots of two hundred acres each. These lots may be further divided, creating two one hundred acre parcels. Lots divided along their length create "long hundreds", and lots split along their width create "square hundreds" (Figure 13).

Figure 13: CONCESSION and LOT DIVISIONS



SOURCE: Food Land Development Branch, "Reference Information re the Forestry Agricultural Resource Inventory of Eastern Ontario." Toronto: 1980, p. 13.

DRT '81

Land uses, when discernable, were pre-typed from the photo. The forested areas, the urban and other non-agricultural uses were pre-typed according to visible boundaries. Agricultural land use systems were pre-typed based on the one hundred acre blocks. Fields which displayed uniform texture, tone or pattern on the photo were grouped together and given a tentative agricultural land use system designation. The guidelines used for pre-typing the agricultural land use systems are listed in Table 3.

Table 3
PRE-TYPING GUIDELINES

Agricultural Land Use System	Tones and Patterns on the Air Photo
Monoculture	large blocks of uniform light grey or white tones
Corn & Mixed	a mix of grey, black and white tones; corn systems will have more white tones than mixed systems
Hay & Pasture	a mix of dark grey and black tones; small field patterns.
Grazing	predominantly grey tones with smooth texture; fencelines and field patterns are difficult to distinguish; cow paths, animals or rock outcrops may be visible with stereoscopic inspection

4.1.3 The Field Survey

Field notes were made by encoding the existing use of each field onto the mylar overlay. A small check mark was used to indicate fields of corn, a small "x" was used to denote fields of various small grain crops (oats, barley, buckwheat, etc.), and fields of pasture were identified with a small circle ("o"). Because hay is a dominant agricultural land use in Eastern Ontario fields of hay did not receive a land use symbol; rather, they were marked with a dot to indicate that the field had been observed and the use noted.

The non-agricultural land uses which were pre-typed were checked during the field survey. Those uses not pre-typed were recorded, so that every hectare of each township was given a land use designation.

The FARINEO area was mapped at an average of 3,500 acres per day per crew. The amount of forest land in a township affected the rate of mapping. As illustrated in Table 4, when there was more forest land, mapping took longer. If forest lands are not inventoried, as in Southwestern Ontario in 1981, mapping may proceed much faster — from 8,000 to 10,000 acres per day per team.

Table 4
LAND USE MAPPING RATES

% Agriculture in Township	%Forest in Township	Number of Acres Mapped per day per 2 person team
85	15	3,500-4,000
70	30	2,900-3,400
50	50	2,200-2,700
30	70	1,500-2,000
15	85	900-1-400
0	100	800 or less

Source: Food Land Development Branch. "Reference Information Re the Forestry Agricultural Resource Inventory of Eastern Ontario." Toronto, 1979 (Mimeographed), p. 17.

4.1.4 Agricultural Land Use Systems

When all the field mapping was completed a second mylar sheet was placed on top of the first. On this mylar the agricultural land uses were amalgamated into the systems described in Chapter 2. The final agricultural land use systems designations were made by comparing the existing land uses as shown by the field notes on the mylars to the previous land uses pre-typed from the photo. The other uses noted during the field survey were also added to this second mylar to complete the township land use map.

4.1.5 The Township Base Map

A base map was prepared for each township at a scale of 1:50,000 by piecing the townships together using the National Topographic Service (NTS) 1:50,000 map sheets. The NTS map was selected as a base because it depicts most natural and man-made features of the landscape including rivers, contours, roads, buildings and forest areas. In addition, NTS maps are geo-referenced using the Universal Transverse Mercator Grid, a feature which facilitated the computerization phase of the project.

A reflex chronaflex master was made from each township map. While not an exact method for preparing the base maps, the match along township boundaries was quite accurate when the maps were assembled into counties by the computer.

4.1.6 The Draft Township Land Use Map

The draft township land use maps were drawn as mylar overlays of the 1:50,000 township base maps. The land use information from the second mylar overlays of the photos was transferred to the draft maps. The draft maps were then checked to make sure each polygon was completely closed and had a legend notation.

4.1.7 The Final Township Land Use Map

The draft township land use maps were sent to the Cartography Section, Land Resource Science, University of Guelph to be drawn on the chronaflex masters. The completed land use masters are kept on file, and from them black and white print copies are made for distribution. Copies of these maps are included in Appendix 2.

4.1.8 Updating

The land use information, if it is to remain current, should be updated. While carrying out the inventory, three different updating techniques were tested.

4.1.8.1 Video Tape

Ground cover of Finch Township was video-taped from the air.

One concession block was filmed per aerial pass. At the same time, an agrologist recorded the sequence of crops and ground cover on cassette tape as they appeared on a monitor screen connected to the video camera. A land use mapper could then play back the video tape and the cassette tape and transfer the recorded information onto pre-typed photos or directly onto a base map to produce a new, updated land use map.

4.1.8.2 35mm Slide Photography

The concession blocks of Finch Township have also been photographed from a Cessna 172 aircraft using 35mm colour slide film. The photos were taken from an altitude of 2,000 feet above ground level. Each concession was photographed from two directions of flight, so that both the "front" and the "back" of the concessions were filmed. Using ground truth data recorded on a cassette tape as was used with the video filming, an accurate land use map can be prepared.

This method, using two different types of aerial photography, could be used to update the land use inventory at reduced cost, since less labour is required. The revised map would also be ready sooner than if a full survey using fields crews was undertaken. It also spreads out the work load, with the data collection being concentrated over a short period of time. It would take between two and two and a half hours to film an average size township of 50,000 acres. The interpretation can be left to a later date. For this type of inventory, the data collection should be done when there is the greatest variation in crop colours, usually from mid-July to mid-August, depending on the location of the study area.

4.1.8.3 LANDSAT Imagery

The Ontario Centre for Remote Sensing[24] has proposed an updating procedure for the agricultural land use systems using LANDSAT satellite imagery. The LANDSAT satellite provides repetitive coverage at eighteen-day intervals. A 185 kilometre swath is imaged during each orbit.

LANDSAT data are digitally recorded, which facilitates computer analysis. The computer identifies and maps the land cover types automatically.

A series of LANDSAT images taken at specific times during the growing season can be used to identify crop cover based on a crop calendar describing the relationships between the growth cycles of the various crops. The calendar, in conjunction with the patterns observed on the imagery and the interpretation of these relationships, can be used to make an accurate assessment of agricultural land use.

Spring imagery (April or May) will identify areas of crop cover and bare ground. At this time of year, the crop cover would be either hay or pasture. Cultivated fields will be those fields which are bare ground in the spring, and are crop cover in the summer (June or July). The cultivated fields can be identified by crop type by using early fall imagery (September or October). Crop cover which disappears in August or September in Eastern Ontario is spring grain, since little wheat is grown there. Crop cover still present in the fall is either hay and pasture, or corn. Hay and pasture will show up as crop cover in both the spring and the fall, and corn will be identified as crop cover in the fall and bare ground in the spring.

This technique for land use mapping is still being developed and is not fully capable of identifying these various land uses. As this system becomes more refined, the application of this technique to land use mapping will become more technically feasible.

[24]Ontario Centre for Remote Sensing "Proposal for Agricultural Land Use Mapping of Ontario using Digital Image Analysis Techniques." Toronto, 1981 (Mimeographed) pp. 1-2

4.2 FOREST LANDS INVENTORY

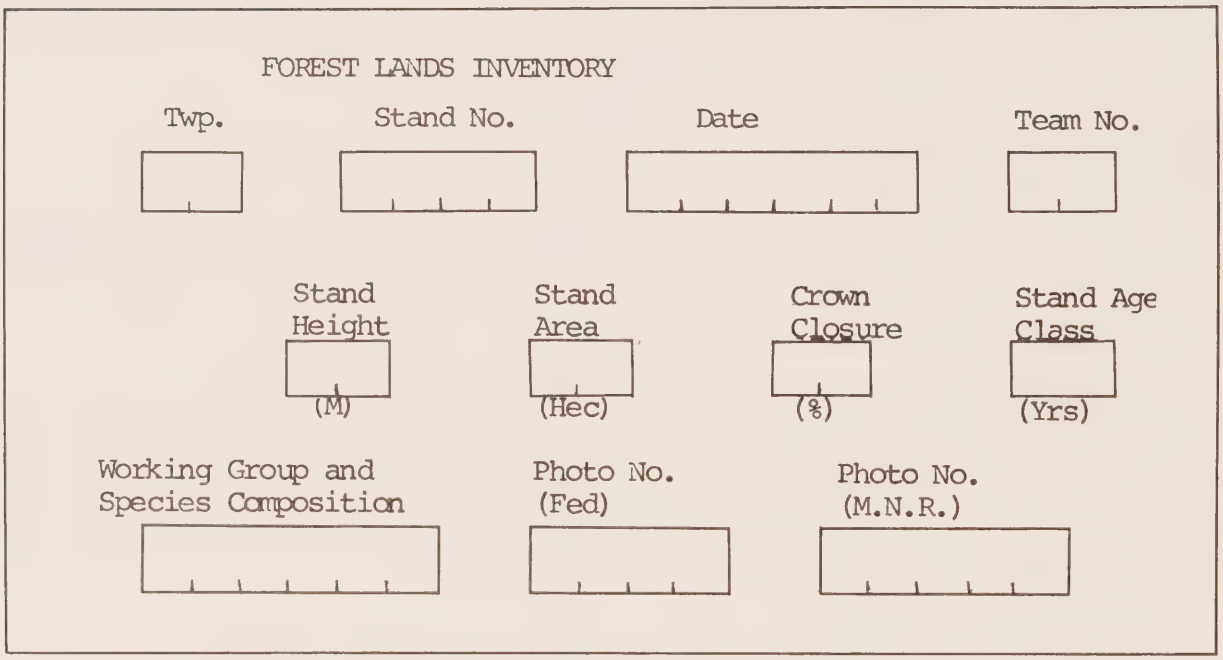
At the time the land use information was being mapped in the field, the forest lands information was also recorded.

To prepare for the forest lands field work, the 1:30,000 or 1:36,000 scale land use air photos were pre-typed especially for this field work. All woodlots were identified and pre-typed from the photos. Each was given a forest stand number. Initially the stands were numbered sequentially on each photo. Later, the photos were combined into township mosaics, and the numbering was adjusted so that every stand in each township was numbered consecutively.

Once the woodlots were pre-typed and numbered, the photos were interpreted to help identify the species present and to determine the crown closure density of each stand. Areas with less than forty-five percent crown closure density were not included as woodlands, but were designated as idle agricultural land (A2).

The woodlots identified by pre-typing were classified by the forester in the field. Since many woodlots in Eastern Ontario are privately owned, a visual inspection of each woodlot was made rather than taking measurements along a transect through the forest. To ensure the highest possible level of accuracy, each woodlot was viewed from as many locations as possible. The information collected was recorded on forest lands inventory index cards (Figure 14); one card per woodlot. Each card was referenced to its woodlot by the photo number. As well, the crown closure density (percent), the average stand height and age, and the forest stand number were noted on the index card.

Figure 14
FOREST LANDS INVENTORY INDEX CARD



The three predominant tree species present were identified and recorded according to their relative distribution within the stand. For example, if a stand contained approximately fifty percent poplar, thirty percent ash, and twenty percent soft maple, the species were recorded as: Po_5 Aw_3 Ms_2, demonstrating the relative composition of the stand.

Codes were used for stand age (Table 5) and tree species present (Table 6) to speed the inventory work and to simplify the recording procedure.

Table 5
FOREST STAND AGE CLASSES

Forest Age	Class Number
1-20	1
21-40	2
41-60	3
61 +	4

Table 6
FOREST SPECIES CODES

CONIFERS

Species	Code	Species	Code
Austrian Pine	PA	Pitch Pine	PP
Balsam Fir	BF	Red Cedar	CR
Black Spruce	SB	Red Pine	PR
Colorado Spruce	SC	Red Spruce	SR
European Larch	LE	Scots Pine	PS
Hemlock	HE	Tamarack	LA
Jack Pine	PJ	White Cedar	CE
Norway Spruce	SN	White Pine	PW
		White Spruce	SW

DECIDUOUS

Species	Code	Species	Code
Alder	AZ	Poplar	PO
All Species-no dominant species	AS	Red Maple	MR
Basswood	BD	Red Oak	OR
Beech	BE	Sassafras	SS
Black Ash	AB	Silver Birch	BS
Black Cherry	CB	Soft Maple	MS
Black Locust	LB	Sycamore	SY
Black Walnut	WB	Trembling Aspen	AT
Butternut	BN	Tulip Tree	TT
Cottonwood	PD	Weeping Willow	WE
Elm	EM	White Ash	AW
Hard Maple	MH	White Birch	BW
Hickory	HI	White Elm	EW
Ironwood	IW	White Oak	OW
Large Tooth Aspen	AL	White Willow	WW
Laurel-Leaf Willow	WL	Yellow Birch	BY

4.2.1 Forest Lands Map

The forest lands inventory index cards are on file at the Food Land Development Branch of the Ontario Ministry of Agriculture and Food. The FARINEO land use maps were enlarged to 1:25,000 scale and used as base maps for the recording of this information. These maps were selected because they were readily available and already had the forest areas outlined on them.

The forest stands on the maps were numbered according to the stand numbers on the photos. The information collected for each stand was then recorded in the map margin. These maps were then sent to be digitized. At the time of writing, fourteen townships have been digitized.

4.3 DRAINAGE INVENTORY

An inventory of existing tile and municipal drainage was conducted concurrently with the land use and forestry inventories during the summer of 1980 by a separate group of students.

Since tile drainage is not readily recognizable on black and white air photos or from the field, a different methodology was used. Air photos at a scale of 1:10,000 taken in 1978 were indexed to the NTS township base maps using flight line and photo numbers, ensuring that coverage was complete for each township. The photos were then overlaid with mylar.

From OMAF drainage records, county engineers' drainage survey files, tile drainage contractors' files and township records, a list of farmers who had made drainage improvements was compiled for each township. The farmers on these lists were then interviewed, each identifying his farm on the air photo. Tiled fields were identified by the farmers and sketched on the mylar overlay of the photo. The number of acres drained, the year of installation and the location of the outlets were noted and recorded on drainage index cards (Figure 15).

Figure 15
DRAINAGE INVENTORY INDEX CARD

OWNER _____ PHOTO NO._____

TOWNSHIP _____ CON._____ LOT_____

TOTAL ACREAGE OF FARM_____ ACRES WORKABLE_____

DRAINAGE COMPLETED:

	Random	Systematic	Spacing	Acres	Year
Area A	_____	_____	_____	_____	_____
Area B	_____	_____	_____	_____	_____
Area C	_____	_____	_____	_____	_____
Area D	_____	_____	_____	_____	_____

OUTLET:

	Mun. Drain	Natural Watercourse	Road Ditch	Private Ditch	Other (Specify)
Area A	_____	_____	_____	_____	_____
Area B	_____	_____	_____	_____	_____
Area C	_____	_____	_____	_____	_____
Area D	_____	_____	_____	_____	_____

REMARKS:_____

_____ Sketch Over Initials_____

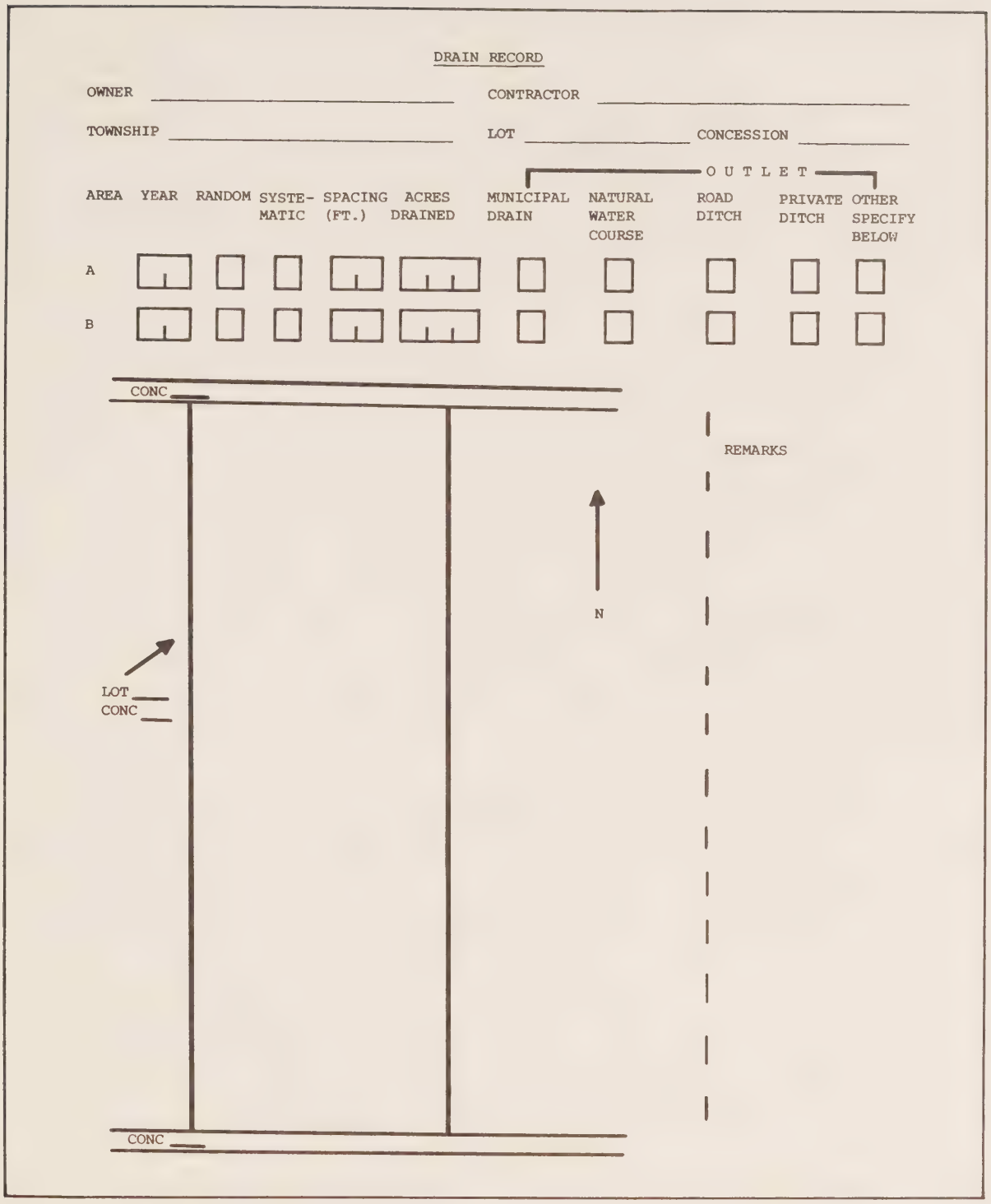
Farms were numbered sequentially when more than one occurred on a single photo. When a farmer had more than one tile-drained field, each field was identified separately, particularly when the work had been done at different times, or had different outlets.

The tiled fields, as illustrated on the air photos and on the drainage index cards for each township, were transferred onto 1:25,000 scale Artificial Drainage Systems township base maps. These maps were made available to FARINEO by the Drainage Section of the Food Land Development Branch. Roads, municipal drains and river alignments were checked and, if needed, were amended to bring these maps up to date.

4.3.1 Drainage Update

Subsequent to this drainage inventory, an updating procedure was developed by the Food Land Development Branch in co-operation with the Tile Drainage Contractors of Ontario. The contractors have been provided with a form modelled after the drainage index card (Figure 16) to be filled out when a new installation has been completed. This information provides the date of the tile installation, the number of acres drained, a sketch of the location of the fields in which the tile were installed and the location of the outlets. One copy of each completed form is sent to the Food Land Development Branch so the drainage records and maps can be updated.

Figure 16
DRAIN RECORD FORM



This updating survey has been expanded to include the other agricultural areas of the province so that detailed drainage information from across the province eventually will be available.

4.4 FARM BUILDINGS

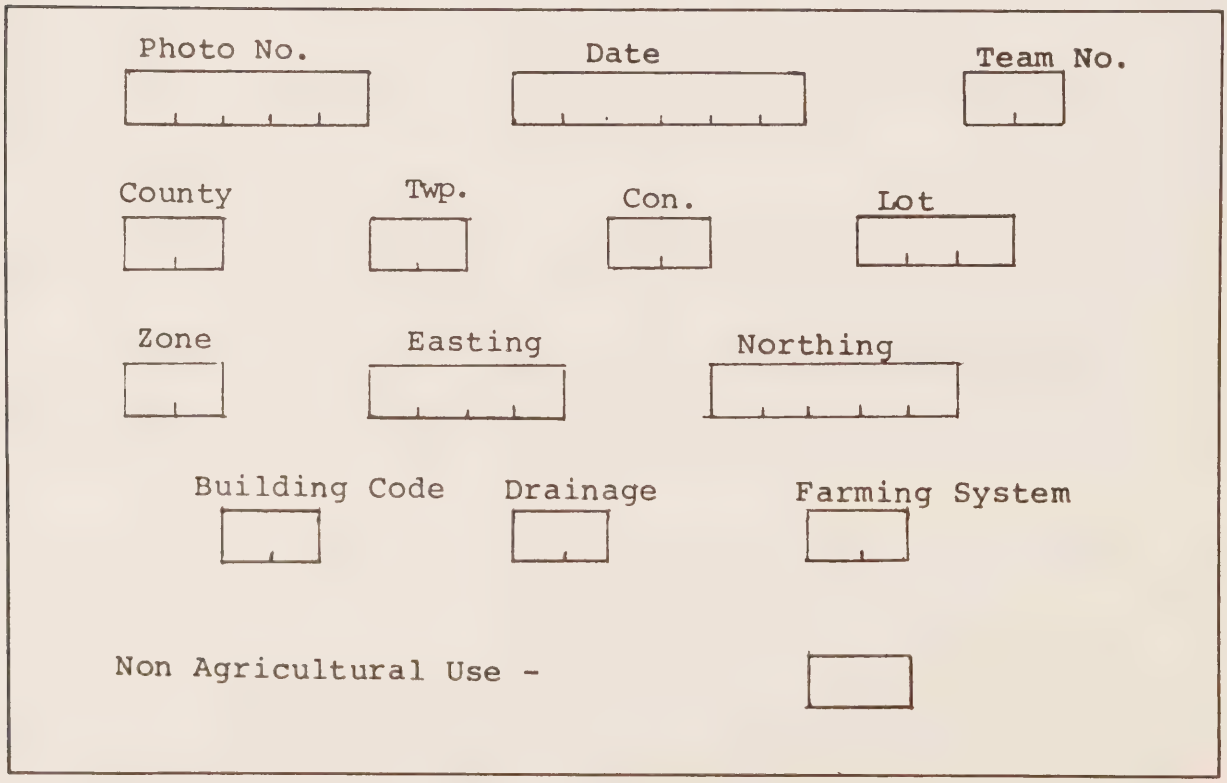
While the land use information was being collected, the land use mappers also coded each set of farm buildings. By noting the type of farm buildings present, a more accurate picture of the intensity of agriculture in the area is possible, since knowledge of farm structures leads to a better understanding of the agricultural systems present, and gives an indication of the investment farmers have in their operations.

A series of codes was developed to evaluate the utility value of each set of buildings (Table 7). The code number for each set of buildings was written on the land use mylar on top of the buildings on the photo. This code was also recorded on a farm buildings index card (Figure 17). The exact location of the farm buildings to the nearest one hundred metres (μsing the Universal Transverse Mercator (UTM) grid), the associated land use system, lot, concession, township and county were also recorded on the index card.

Table 7
FARM BUILDING CODES AND DESCRIPTIONS

Code	Descriptions
1	Large modern building with silo(s). Building with harvestore silos may also fall in this category
2	Small modern building usually without silos unless noted. Usually hog farms, poultry, productive hobby farms
3	Small, usually modern building, no silo present. Hobby farms, etc. (horses, goats, etc)
4+	Large older building with significant improvements such as harvesters, milking parlour, feeder systems, modern stable cleaner, etc., used for a specialized enterprise e.g. dairy
4	Large older building with improvement such as silo(s) roscoe bins, etc.
4–	Large older building with improvements but requires some repairs and modernization to reach the standard of a typical "4"
5	Large older building in good condition without silo or significant improvements
6	Large older building in poor shape without improvements
7	Small older building in good shape, or with improvements
8	Small older building in poor shape, requiring repairs
9	Decrepit building, usually unusable and falling down
0	Abandoned suffix — unused state for all of the above buildings

Figure 17
FARM BUILDINGS INDEX CARD



No attempt was made to estimate the dollar value or amount of capital invested in the buildings. It is possible, though, to assign to each code a relative dollar value and, in combination with the land use systems information, estimate the amount of investment in farming for a specific area.

4.5 CANADA LAND INVENTORY

All land use is based on soil. The Ontario soil classification system is the Canada Land Inventory (CLI). The capability of land for agriculture, forest production, recreation and wildlife was mapped using this system. The capability for agriculture information was included as part of FARINEO so that the land use information could be related to the soils. To provide a soil map overlay which would be as accurate as possible, the original soil series survey map for each township was photographically enlarged and adjusted to 1:25,000 scale. Then, each soil series polygon was assigned a CLI soil capability for agriculture value taken directly from the 1:50,000 CLI soil capability for agriculture maps. Each soil type had an accompanying CLI rating, and every polygon was coded with both of these identifiers. A sample of the FARINEO soil survey/ CLI capability for agriculture map is provided in comparison to a regular soil series map in Figure 18.

At the time of writing, the Canada Land Inventory and Soil Series information was awaiting computerization.

Table 8
CLI CAPABILITY RATING FOR AGRICULTURE

Class	Descriptions
1	no significant limitations to use for crops
2	moderate limitations that restrict the range of crops or require moderate conservation practices.
3	moderately severe limitations that restrict the range of crops or require special conservation practices.
4	severe limitations that restrict the range of crops or require special conservation practices, or both.
5	very severe limitations that restrict the capability to produce perennial forage crops, but improvement practices are possible.
6	capability for producing perennial crops only; improvement practices are not feasible
7	no capability for crop use or permanent pasture.

Organic Soils — not rated.

Source: Environment Canada Lands Directorate. *Canada Land Inventory — Soil Capability for Agriculture 1:1,000,0000 Map Series, Ontario.* Ottawa: Environment Canada, Lands Directorate, 1975, map legend.

4.5.1 Capability for Agriculture

There are seven soil capability ratings for agriculture based on the nature and severity of the biological, climatic and physical limitations of the resource base affecting agricultural productivity (Table 8). These classes are broken down into subclasses which describe the various limitations (Table 9).

The CLI Information is subject to the following conditions:[25]

1. Soils are well managed and cropped, under a mechanized system of farming.
2. Land requiring improvements which can be made by the farmer (clearing, for example) is classed according to its limitations after the improvements have been made.
3. Land requiring improvements beyond the capability of the individual farmer is classed according to its present condition.
4. Distances to markets, types of roads, location, size of farm, type of ownership, cultural patterns, skill or resources of individual operators, and risk of crop damage by storms are not considered when classifying land.

[25]Environment Canada, Land Directorate. *Canada Land Inventory Soil Capability for Agriculture, 1:1,000,000 Map Series. Ontario,* Ottawa: Environment Canada. Lands Directorate, 1975 Map legend.

Figure 18
FARINEO SOIL SURVEY/CLI AGRICULTURAL CAPABILITY MAP vs. SOIL SURVEY MAP

(a) Soil Series Map (1:63,360) (b) Canada Land Inventory (Agriculture) Map (1:50,000) (c) FARINEO Soils/Canada Land Inventory (Agriculture) Map (1:25,000)

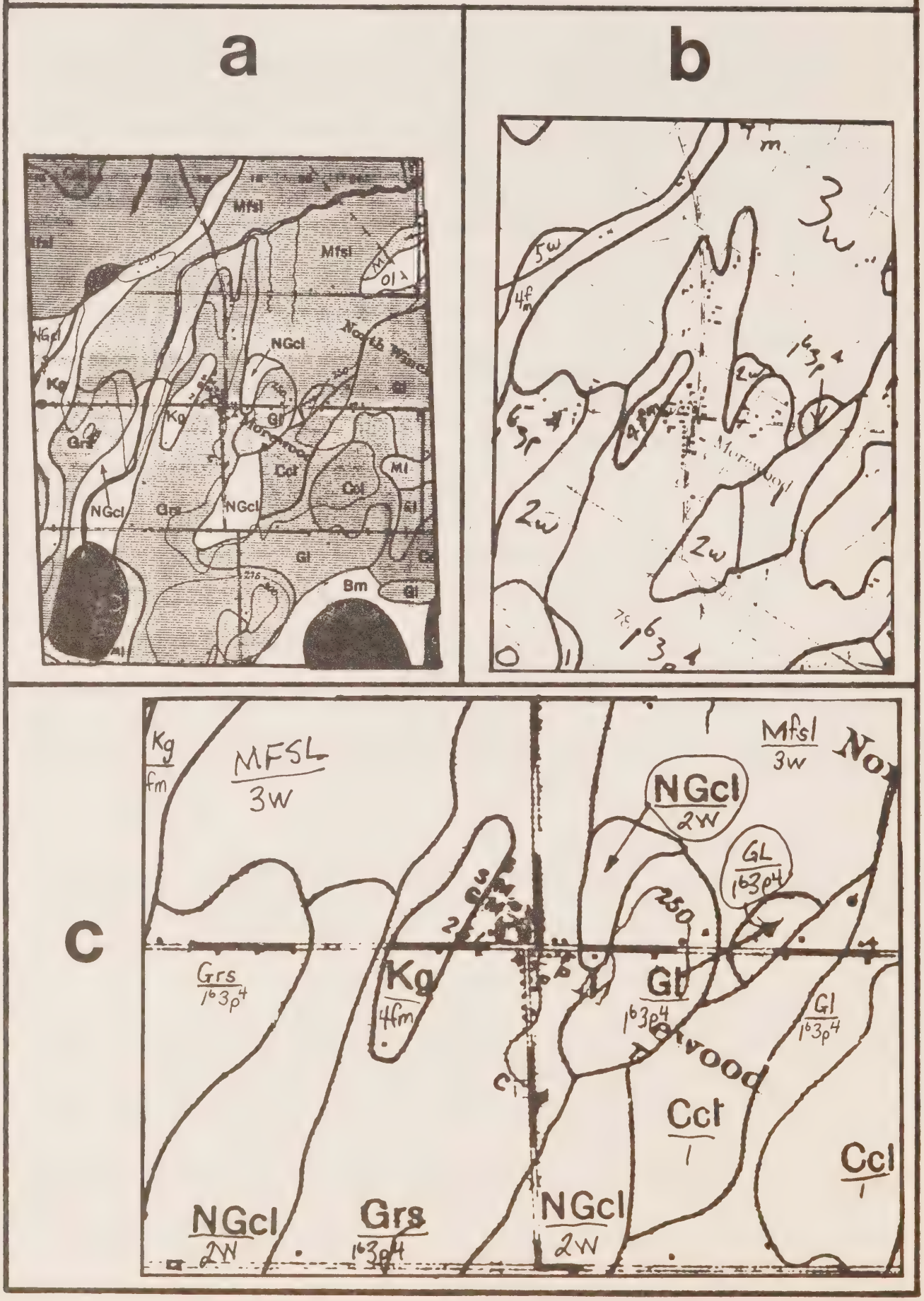


Table 9
CLI LIMITATION SUBCLASSES

Subclass	Descriptions
A	droughtiness or aridity as a result of climate
D	undesirable soil structure and/or low permeability
E	past damage from erosion
F	low natural fertility
H	adverse climate as a result of low temperatures
I	periodic inundation by streams, lakes
M	deficient soil moisture
N	salinity
P	stoniness
R	shallowness to bedrock
S	a combination of two or more of D, F, M and N
T	adverse relief as a result of steepness of slope
V	a pattern of intimately associated soils having W and M subclasses
W	excessive soil moisture
X	an accumulation of two or more adverse characteristics that individually would not affect the class rating.

Source: Environment Canada Land Directorate. *Canada Land Inventory Soil Capability for Agriculture 1:1,000,000 Map Series, Ontario.* Ottawa: Environment Canada Lands Directorate, 1975 Map Legend.

4.5.2 Capability for Commercial Forest Production

The capability of soils for forestry has also been rated by the CLI. This information is not part of the FARINEO inventory, but is available from the Canada Map Office, Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa. As with agriculture, there are seven capability classes based on the severity of limitations for commercial forest production. These classes are described in Table 10.

Table 10
CLI CAPABILITY RATING FOR FORESTRY

Class	Descriptions
1	Lands have no important limitations to the growth of commercial forests.
2	Lands have slight limitations to the growth of commercial forests.
3	Lands have moderate limitations to the growth of commercial forests.
4	Lands have moderately severe limitations to the growth of commercial forests.
5, 6	Lands have severe limitations to the growth of commercial forests.
7	Lands have severe limitations that preclude the growth of commercial forests.

Source: Environment Canada, Lands Directorate. *Canada Land Inventory — Land Capability for Forestry 1:1,000,000 Map Series, Ontario.* Ottawa: Environment Canada, Lands Directorate, 1975, Map legend.

5
COMPUTER APPLICATIONS FOR FARINEO

The FARINEO inventory uses two different mapping techniques. Black and white line maps were drafted first. These are inexpensive and easy to prepare. From them Chronaflex masters were made and are run through an Ozalid copier when more paper copies are required.

However, these line maps are not suited to the analysis of two or more data themes. For example, it would be difficult to show and provide an areal tally of the amount of CLI Class 1 to 4 land with tile drainage in one township using this type of mapping. Another mapping technique is required for this type of data analysis.

To overcome this problem, the FARINEO maps were computerized using the Ontario Hydro Route and Site Selection Division PDP 1170 mini-computer and Calcomp digitizer. The resulting computer maps are plotted by a Versatec 36-inch plotter. Seventeen shade patterns are available to distinguish mapped values (Figure 19).

Figure 19
ONTARIO HYDRO SHADING PATTERNS AVAILABLE FOR COMPUTER MAPS

Computer mapping accommodates the difference in scale among the five data sets. The land use and CLI maps are at 1:50,000 scale, the drainage maps and the forest lands maps are at 1:25,000 scale and the soil series maps are at 1:63,360 scale. These maps can be input at these scales, and used for data analysis at a uniform scale. That is, the computer can use the digitized information of all data sets at one common scale, eliminating the scale problems of manually overlaying the maps for data analysis.

Through computerization, data can be analyzed because any number of information sets can be overlaid and combined. When data sets are overlaid on one area, a "derived" map is produced for that area showing the relationships among the data sets overlaid and the geographic distribution of those relationships. Maps of different areas may also be overlaid to produce a single map of several areas. For example, when the land use maps of the townships of Russell, Cambridge and Clarence (making up Russell County) are overlaid, the resultant map shows the land use of Russell County.

For each map, the computer records the area of each variable in hectares. The land use map for Cambridge Township, for example, will show the areas of forest (among other land uses) and provide the total number of hectares of forest shown on the map. This hectarage value is computed for every variable displayed on the map.

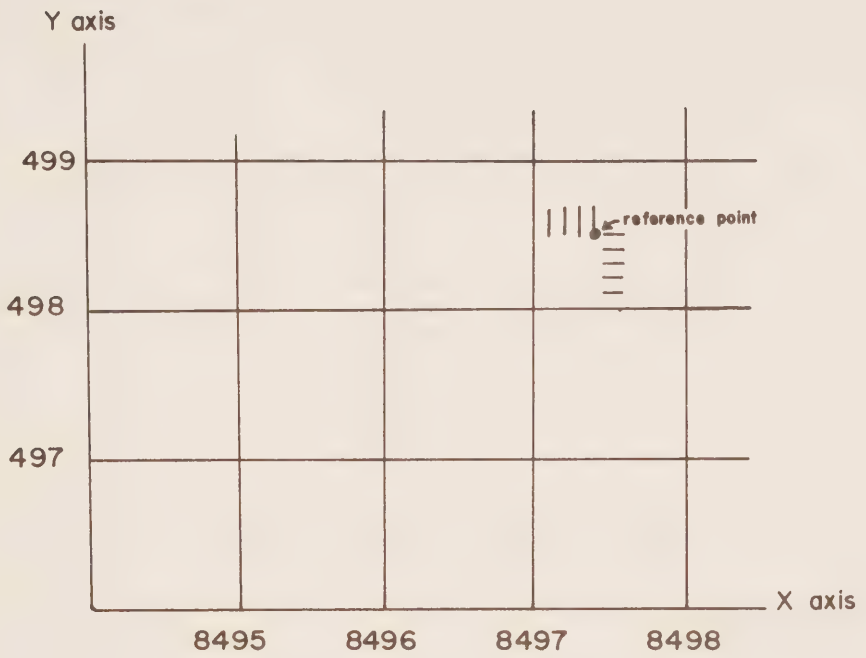
An added benefit of the computer is variable scale selection. The computer maps can be plotted at virtually any requested scale.

The ability of the computer to combine areas and overlay data themes is a time saving tool. Computerization facilitates this data analysis and is one of the main reasons the information was digitized.

5.1 DIGITIZATION

Before the maps could be computerized, each had to be referenced to the others so that they could be overlaid. Ontario Hydro uses the Universal Transverse Mercator grid referencing system. This is the standard 6 degree grid referencing system used on NTS topographic map sheets. This system geographically references every point on a map to that same point on the ground. The point is tied to its location by its unique UTM co-ordinates — easting (x axis) and northing (y axis). To geo-reference the FARINEO maps, four points were located on each map and assigned their UTM co-ordinates (Figure 20). The coordinates of these points were determined to the nearest 50 meters using the 1:50,000 NTS township base maps. Since all the FARINEO maps are geo-referenced, several data sets can be overlaid, or map areas can be combined to show larger areas. In fact, a map of the 27-township area has been prepared. This map combined the 27 individual maps into one map, and changed the scale from 1:50,000 to 1:100,000.

Figure 20: UNIVERSAL TRANSVERSE MERCATOR (UTM) GRID- Referencing a Point to the Nearest 50 Metres



EASTING - Read number on the grid line immediately to the left of the point. Estimate tenths of square from this line eastward to the point.

8497
4
84974

NORTHING - Read number on the grid line immediately below the point. Estimate tenths of square from this line northward to the point.

498
5
4985

The UTM grid reference is written as $\frac{\text{Easting}}{\text{Northing}}$, or $\frac{84974}{4985}$.

Source: Surveys and Mapping Branch, Energy, Mines and Resources. NTS Map Sheet Margin Notes.

DRT '84

The drainage and soil series maps do not have a UTM grid. For these maps, the following method was used for calculating geo-referenced UTM co-ordinates (Figure 21)[26].

(1) Locate well-defined features near the perimeter of the map sheet and assign them approximate UTM co-ordinates from the NTS base map.

(2) Measure the distances AE, AC, and EC using the map scale.

(3) Calculate the distances AE, AC and EC using the UTM co-ordinates and Pythagorean Theorum (since triangles AFE, EDC and ABC are right triangles). The theorum states that the square of the hypotenuse of a right triangle is equal to the sums of the squares of the other two sides. Accordingly:

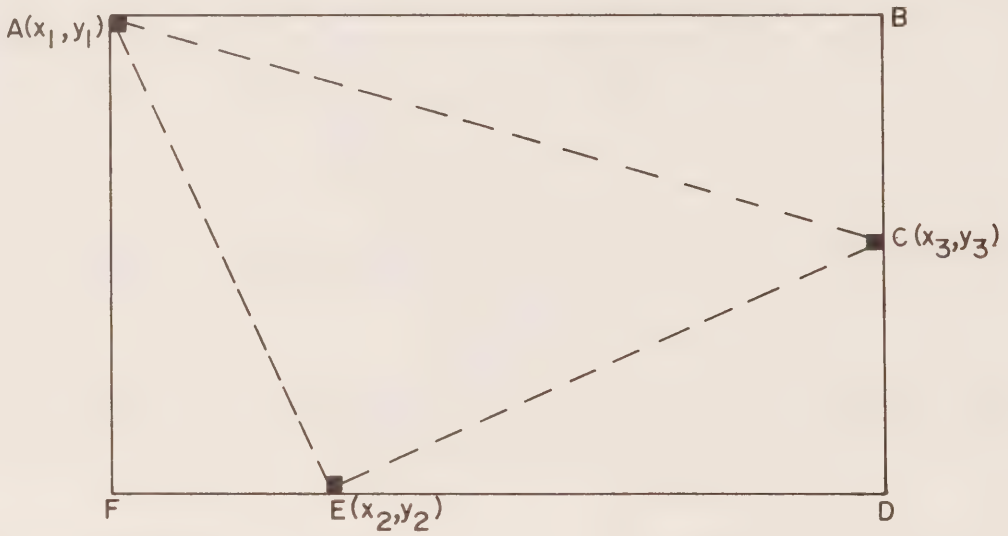
$$AC = \sqrt{AB^2 + BC^2} = \sqrt{(x_3 - x_1)^2 + (y_3 - y_1)^2}$$

$$AE = \sqrt{AF^2 + FE^2} = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$$

$$EC = \sqrt{ED^2 + CD^2} = \sqrt{(x_3 - x_2)^2 + (y_3 - y_2)^2}$$

(4) The scaled distances should correspond to the calculated distances suggested by the co-ordinates. If the distances do not correspond, amend the co-ordinates as necessary.

Figure 21: **Determining UTM Co-ordinates Without a UTM Grid**



DISTANCE EQUIVALENTS:

$AB = (x_3 - x_1)$ $\quad DE = (x_3 - x_2)$ $\quad EF = (x_2 - x_1)$

$BC = (y_1 - y_3)$ $\quad CD = (y_3 - y_2)$ $\quad AF = (y_1 - y_2)$

$$AC = \sqrt{(x_3 - x_1)^2 + (y_3 - y_1)^2} \qquad AE = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$EC = \sqrt{(x_3 - x_2)^2 + (y_3 - y_2)^2}$$

when x_n and y_n are assumed UTM co-ordinates.

DRT'81

To begin digitizing, the four geo-referencing co-ordinates of the map were entered into the computer as point locations. Then, each polygon was traced with an electronic cursor which recorded the lines as a series of points. Because the map was initially geo-referenced, each point was assigned its correct UTM co-ordinates, storing the polygon at its geographically correct location. Since each polygon was input separately, some lines

[26]Method described in memo from L. Ives, Senior Planner, Land Use and Environmental Planning Department, Ontario Hydro, to G. Jackson, Associate Director, Food Land Development Branch, OMAF, April 22, 1980.

were input twice (as the outline of adjacent polygons). A certain margin of error was expected because the lines were input twice. To compensate, the maps were digitized at 1:25,000 scale, so that when they are plotted at 1:50,000, the digitizing errors are minimized. In addition, the 1:25,000 scale maps were easier for the digitizer operators to use.

5.2 CODING THE DATA

5.2.1 Land Use

The land use systems and types were digitized as a series of contiguous polygons. Each land use system or type was given a five-digit computer code word. The computer uses these code words rather than the symbols used on the line map to designate land uses to polygons. Each polygon was coded using the code word corresponding to its land use designation:

Computer Code	Line Map Symbol	Description
MONOC	P	Monoculture System
CORN	C	Corn System
MIXED	M	Mixed System
HAY	H	Hay System
PASTR	HG	Pasture System
GRAZE	G	Grazing System
SPAGR	K	Specialty Agriculture
IDLER	A1	Idle Agricultural Land
IDLES	A2	Idle Agricultural Land
WOODL	Z	Woodland/Forest
WOODP	Zp	Pastured Woodland
REFOR	Zr	Reforestation
WETLD	X	Swamp or Marsh
PITQU	E1	Extraction -sand & gravel pits & quarries
EXTRA	E2	Extraction -top soil removal
BUILT	B	Built-up
SODFM	T	Sod farms
RECRN	R	Recreation
WATER	W	Water

The computer map in Figure 22 shows the areas of intensive and non-intensive agricultural land use in the FARINEO counties. The codes "MAALU" and "MATWP" are used by Ontario Hydro to identify the computer files for the agricultural land use and township outline data.

5.2.2 Forest Lands Inventory

Multiple attribute digitizing was used to computerize the forest land information. That is, rather than assigning only one value for each polygon, as was done with the land use maps, several values were assigned to each polygon. In this way, each polygon was digitized once, then the attributes were assigned: forest stand number, height, area, age, crown closure density and tree species composition. The codes in Tables 4 and 5 were used for digitizing age and tree species.

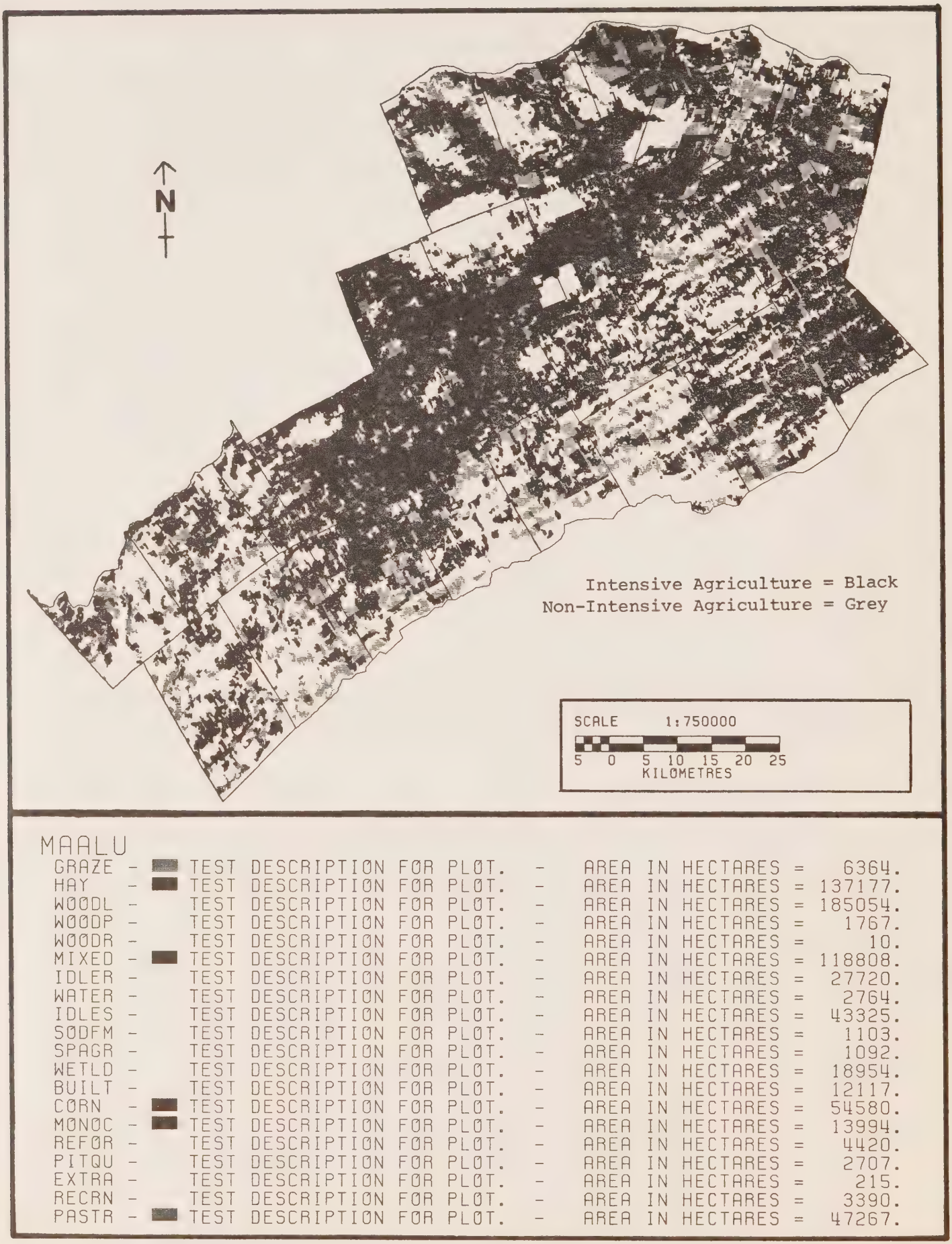
For example, in Longueuil Township:

Stand No.	Species	Height (m)	Area (ha)	Crown Closure	Age Class
1	$Ce_4Sw_4Aw_2$	12	12	75	4

each of these variables was input separately:

Forest Stand Number:	1
Species: White Cedar	40%
White Spruce	40%
White Ash	20%
Forest Height	12 m
Forest Area	12 ha
Crown Closure Density	75%
Age Class	4

Figure 22
COMPUTER MAP: INTENSIVE AND NON-INTENSIVE AGRICULTURAL LAND USE — FARINEO AREA



MAALU

GRAZE	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	6364.
HAY	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	137177.
WOODL	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	185054.
WOODP	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	1767.
WOODR	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	10.
MIXED	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	118808.
IDLER	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	27720.
WATER	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	2764.
IDLES	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	43325.
SODFM	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	1103.
SPAGR	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	1092.
WETLD	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	18954.
BUILT	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	12117.
CORN	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	54580.
MONOC	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	13994.
REFOR	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	4420.
PITQU	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	2707.
EXTRA	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	215.
RECRN	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	3390.
PASTR	TEST DESCRIPTION FOR PLOT.	AREA IN HECTARES =	47267.

The computer map in Figure 23 shows the area of woodlots, pastured woodlots and reforestation in the FARINEO counties.

5.2.3 Drainage Inventory

Areas of tile drainage were digitized as polygons. The tile drainage in each lot was digitized separately so that when the area of tile drainage in one lot was contiguous with the tiled area on the adjoining lot, the lot line was used to separate these areas. Linear features such as municipal drains, natural watercourses and roads were not digitized, since this information is available on the drainage line maps.

5.2.4 Farm Buildings

The farm building codes are being digitized using cells rather than polygons. Onto each township is overlaid a 500 metre square grid (each cell represents twenty-five hectares), referenced to the UTM grid. Each set of farm buildings will fall inside one grid cell. Where the buildings for several farms are situated close together, cells will contain more than one code. Not all cells will have a code, since settlement follows the road pattern and not the grid pattern.

5.2.5 Canada Land Inventory

The soil maps were digitized twice — once to record the CLI value for each polygon; again to record the soil series and phase value for each polygon. A sample of the combined soil survey/CLI capability for agriculture map is shown in Figure 19, Section 4.5.1.

5.3 POLYGON TO CELL CONVERSION

To overlay data themes using the Hydro system, polygons must be converted to cells. The information remains the same but is displayed as a series of cells rather than polygons. A cell size of 500 square metres (25 hectares) was selected as suitable for this project.

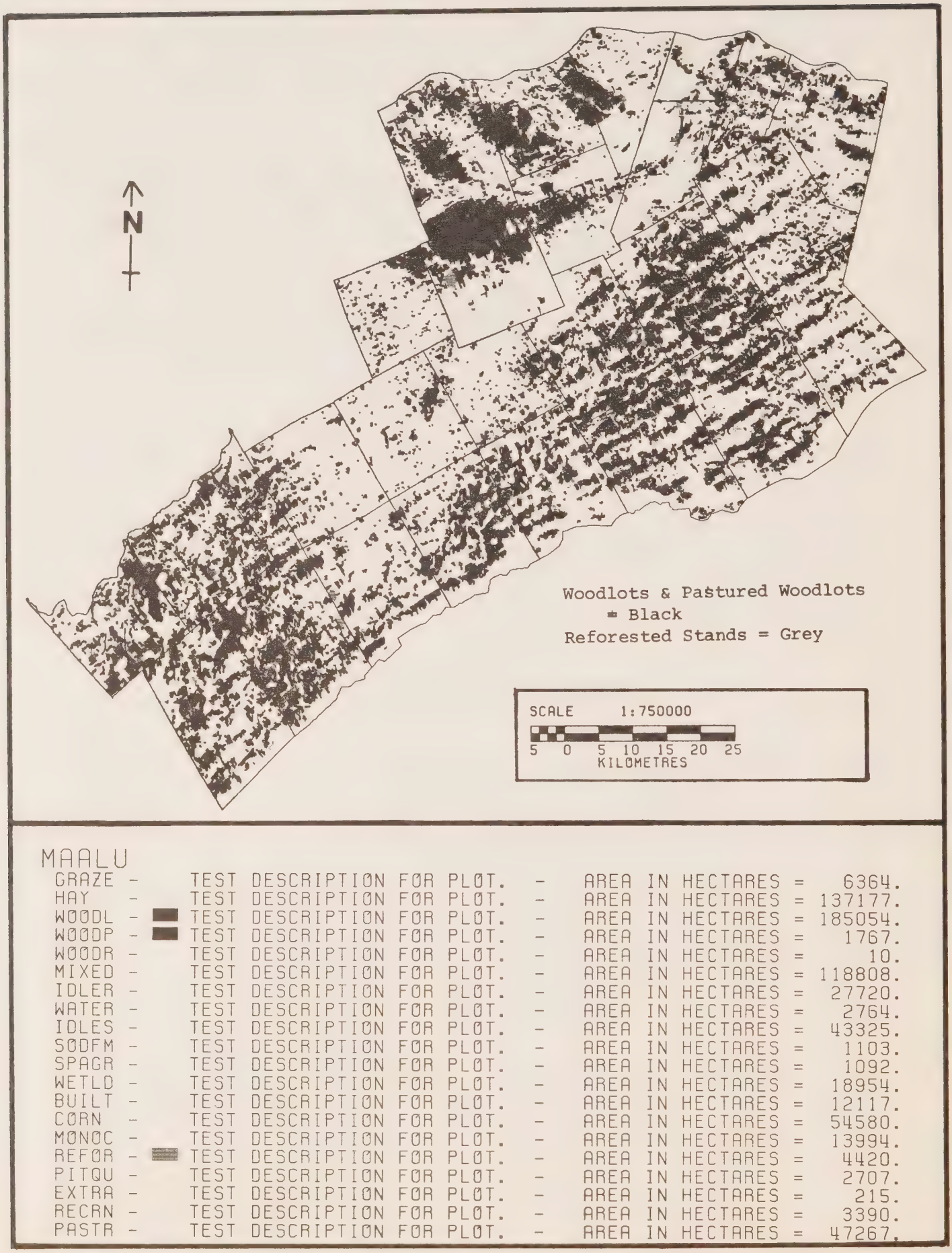
The Hydro computer can overlay polygons, but only with the cell format can it generate the hectarage tally of each combination of variables. Figure 24 (page 46) shows a sample derived cell map for Russell Township. On this map, agricultural land use systems, tile drainage and CLI data themes are combined. The legend codes are described in Table 11.

Table 11
LEGEND CODES FOR DERIVED MAP OF RUSSELL TOWNSHIP (Figure 24)

Code	Description
1MIX	CLI Class 1 land with mixed system (no tile drainage)
2MIX	CLI Class 2 land with mixed system (no tile drainage)
3MIX	CLI Class 3 land with mixed system (no tile drainage)
4MIX	CLI Class 4 land with mixed system (no tile drainage)
4HAY	CLI Class 4 land with hay system (no tile drainage)
1MOC	CLI Class 1 land with monoculture or corn systems
2MOC	CLI Class 2 land with monoculture or corn systems.
3MOC	CLI Class 3 land with monoculture or corn systems.
2DMIX	CLI Class 2 land with tile drainage and mixed system.
3DMIX	CLI Class 3 land with tile drainage and mixed system
4DMIX	CLI Class 4 land with the drainage and mixed system
2DMOC	CLI Class 2 land with tile drainage and monoculture or corn systems
3DMOC	CLI Class 3 land with tile drainage and monoculture or corn systems.

The Russell Township derived map illustrates the type of information FARINEO can provide. Maps can be "tailor-made" for specific purposes. In this example, the CLI capability limitations were combined for all class 2, 3 and 4 soils. For other maps, specific limitation subclasses can be used in isolation. For example, 3w CLI lands can be used to the exclusion of all other classes and limitations.

Figure 23
COMPUTER MAP: FOREST STANDS — FARINEO AREA



MAALU

GRAZE	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 6364.
HAY	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 137177.
WOODL	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 185054.
WOODP	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 1767.
WOODR	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 10.
MIXED	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 118808.
IDLER	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 27720.
WATER	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 2764.
IDLES	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 43325.
SODFM	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 1103.
SPAGR	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 1092.
WETLD	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 18954.
BUILT	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 12117.
CORN	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 54580.
MONOC	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 13994.
REFOR	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 4420.
PITQU	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 2707.
EXTRA	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 215.
RECRN	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 3390.
PASTR	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 47267.

6
OBSERVATIONS

6.1 LAND USE SYSTEMS

In determining the appropriate agircultural land use systems, two years of land cover information were used — one year of field work which identified the crops growing in the field, and one year of crops identified by photo interpretation (pre-typing). The synthesis of this information produces land use maps which are valid for several seasons, rather than the single crop identification inventories which reflect the land use patterns for just one season.

If this same six-county area is updated in the future and the same or similar legend is employed, similarities and changes can then be identified. In three to five years, the percentage of each systems designation in an area may change, but the systems boundaries are likely to remain the same, indicating that some farmers have changed their rotations.

An inventory update could be carried out in the future, to help "set" the systems since an additional year of information would be added to the existing base from which the systems were originally designated. In other words, the first updated map would combine three years of data: the year of photography, the year of the field inventory, and the year of the update. As more updates are done, the base information would continue to build.

The land use systems maps locate the areas in agricultural use. Census data provide statistics on agriculture or farmland, but they do not give the location of these areas within a specific township or Census area. The CLI information indentifies lands of various capabilities to support agricultural use but it does not show where the agricultural use is. FARINEO locates the agricultural land on a geo-referenced base map which can be overlaid on the CLI maps, as well as other thematic maps.

The land use systems qualify the agricultural land uses. The six agricultural land use systems were ranked to distinguish between intensive and non-intensive agricultural use. Monoculture, corn, mixed and hay systems make up intensive agriculture; pasture and grazing systems are non-intensive (Table 12).

Table 12
INTENSITY OF LAND USE

Intensity	Land Use System	Description
HIGH	Monoculture	Single crop
	Corn	40-75% corn with grain and hay
	Mixed	Less than 40% corn with grain and hay
	Hay	Hay, grain and pasture
	Pasture	Improved hay and pasture
LOW	Grazing	Unimproved hay and pasture
		Non-Agricultural Land Uses

Intensive agricultural use accounts for more than half the area of Dundas, Glengarry, Prescott and Russell counties. Individual townships may have as much as 84% of their area devoted to intensive agricultural use. Grenville is the only county with less than half of its area occupied by agriculture. Only one quarter of Grenville is used intensively for agriculture. Since Grenville is located closer to the Canadian Shield than the

Table 13
FARINEO LAND USE HECTARAGES BY TOWNSHIP

	MONOC	%	CORN	%	MIXED	%	HAY	%	INTENSIVE AGRICULTURE	%	PASTURE	%
Dundas												
Matilda	559	2.11	3,047	11.47	3,491	13.14	6,755	25.43	13,852	52.15	2,494	9.39
Mountain	775	3.09	2,677	10.69	6,734	26.89	6,901	27.56	17,087	68.23	719	2.88
Williamsburgh	45	0.17	2,080	7.97	4,205	16.12	2,445	9.37	8,775	33.63	2,286	8.76
Winchester	1,064	4.22	4,692	18.63	9,713	38.56	5,740	22.79	21,209	84.20	753	2.99
Glengarry												
Charlottenburgh	791	2.23	1,643	4.64	7,097	20.02	8,799	24.83	18,330	51.72	2,030	5.74
Kenyon	596	1.78	126	0.38	6,044	18.05	7,198	21.49	13,964	41.70	1,501	4.48
Lancaster	3,779	15.17	3,898	15.65	4,176	16.77	5,534	22.22	17,387	69.81	976	3.92
Lochiel	—	—	1,355	4.36	4,683	15.07	13,737	44.22	19,775	63.65	3,143	10.12
Grenville												
Augusta	77	0.24	2,082	6.58	4,515	14.28	1,542	4.88	8,216	25.98	1,866	5.90
Edwardsburgh	250	0.81	2,122	6.85	2,918	9.42	1,490	4.81	6,780	21.89	4,105	13.26
South Gower	140	1.56	1,625	18.13	548	6.12	1,256	14.02	3,569	39.83	113	1.26
Oxford	94	0.36	1,805	6.87	2,065	7.86	4,981	18.96	8,945	34.05	754	2.87
Wolford	75	0.34	1,471	6.62	84	0.38	3,033	13.64	4,663	20.98	964	4.34
Prescott												
Alfred	—	—	81	0.44	1,899	10.36	8,016	43.73	9,996	54.53	3,366	18.36
Caledonia	305	1.61	809	4.26	3,911	20.60	6,531	34.40	11,556	60.87	1,539	8.11
E. Hawkesbury	—	—	761	3.24	6,617	28.16	6,362	27.08	13,740	58.48	2,357	10.03
W. Hawkesbury	23	0.18	316	2.43	2,533	19.48	1,846	14.20	4,718	36.29	2,111	16.24
Longueuil	58	0.63	751	8.15	1,379	14.97	3,876	42.08	6,064	65.83	740	8.03
N. Plantagenet	367	1.75	336	1.60	1,276	6.07	7,562	36.00	9,541	45.42	1,365	6.50
S. Plantagenet	739	3.59	1,428	6.94	5,431	26.38	6,405	31.11	14,003	68.02	888	4.31
Russell												
Cambridge	399	1.49	4,682	17.45	5,126	19.10	3,051	11.37	13,258	49.41	402	1.50
Clarence	123	0.41	1,563	5.26	4,852	16.33	6,867	23.11	13,405	45.11	2,332	7.85
Russell	1,296	6.51	3,002	15.08	7,843	39.40	2,500	12.56	14,641	73.55	517	2.60
Stormont												
Cornwall	12	0.04	927	3.34	2,321	8.36	1,767	6.36	5,027	18.10	3,226	11.62
Finch	733	3.41	4,480	20.79	8,929	41.44	1,117	5.18	15,259	70.82	2,204	10.23
Osnabruck	—	—	941	3.95	5,175	21.75	1,401	5.89	7,517	31.59	3,354	14.09
Roxborough	903	3.03	4,599	15.42	5,599	18.78	3,578	12.00	14,679	49.23	1,080	3.62
By County												
Dundas	2,443	2.37	12,496	12.15	24,143	23.47	21,841	21.23	60,923	59.22	6,252	6.08
Glengarry	5,166	4.14	7,022	5.62	22,000	17.61	35,268	28.24	69,456	55.61	7,650	6.12
Grenville	636	0.53	9,105	7.58	10,130	8.44	12,302	10.25	32,173	26.80	7,802	6.50
Prescott	1,492	1.20	4,482	3.60	23,046	18,49	40,598	32.58	69,618	55.87	12,366	9.92
Russell	1,818	2.38	9,247	12.09	17,821	23.31	12,418	16.24	41,304	54.02	3,251	4.25
Stormont	1,648	1.60	10,947	10.64	22,024	21.40	7,863	7.64	42,482	41.28	9,864	9.58
FARINEO Total	13,203	2.03	53,299	8.18	119,164	18.28	130,290	19.99	315,956	48.48	47,185	7.24

Table 13 (Cont'd.)

FARINEO LAND USE HECTARAGES BY TOWNSHIP

GRAZING	%	SPECIAL AGRICULTURE	%	TOTAL AGRICULTURE	%	IDLE 1	%	IDLE 2	%	FOREST	%	PASTURED FOREST	%
676	2.54	145	0.55	17,167	64.63	1,487	5.60	2,368	8.91	4,985	18.77	—	—
—	—	38	0.15	17,844	71.26	780	3.11	1,259	5.03	2,484	9.92	34	0.14
546	2.09	4	0.02	11,611	44.50	1,031	3.96	2,797	10.72	8,740	33.50	18	0.08
—	—	3	0.01	21,965	87.20	461	1.83	307	1.22	1,808	7.18	101	0.40
32	0.09	12	0.03	20,404	57.58	386	1.09	1,035	2.92	12,428	35.06	—	—
—	—	13	0.04	15,478	46.22	461	1.38	881	2.63	15,279	45.62	16	0.05
—	—	29	0.12	18,392	73.85	788	3.16	485	1.95	4,886	19.62	10	0.04
75	0.24	9	0.03	23,002	74.04	294	0.95	602	1.94	6,749	21.72	13	0.04
508	1.61	62	0.20	10,652	33.69	2,346	7.82	5,072	16.04	10,544	33.34	89	0.28
416	1.34	13	0.04	11,314	36.53	1,012	3.27	3,088	9.96	13,476	43.52	—	—
143	1.60	48	0.54	3,873	43.23	610	6.81	800	8.93	2,888	32.23	20	0.22
646	2.46	323	1.23	10,668	40.61	1,820	6.93	2,857	10.88	8,122	30.92	48	0.18
1,105	4.97	68	0.30	6,800	30.59	684	3.08	2,507	11.28	7,439	33.47	—	—
—	—	3	0.02	13,365	72.91	382	2.08	202	1.10	2,390	13.04	—	—
—	—	—	—	13,095	68.98	339	1.79	372	1.96	1,778	9.36	76	0.40
142	0.60	2	0.01	16,241	69.12	813	3.46	426	1.81	4,779	20.34	80	0.34
—	—	—	—	6,829	52.53	434	3.34	870	6.69	3,645	28.03	189	1.45
—	—	3	0.03	6,807	73.89	176	1.91	149	1.62	1,447	15.71	80	0.87
27	0.13	—	—	10,933	52.05	685	3.26	630	3.00	7,572	36.05	72	0.34
—	—	27	0.13	14,918	72.46	457	2.22	632	3.07	3,894	18.91	37	0.18
508	1.89	—	—	14,168	52.80	625	2.33	946	3.52	8,753	32.62	—	—
37	0.12	13	0.04	15,787	53.12	1001	3.37	783	2.64	10,973	36.93	101	0.34
168	0.84	—	—	15,326	76.99	993	4.99	574	2.88	2,162	10.86	76	0.38
—	—	19	0.07	8,272	29.79	1,535	5.53	4,035	14.53	10,335	37.23	102	0.37
160	0.74	—	—	17,623	81.79	521	2.42	870	4.04	1,606	7.45	58	0.27
283	1.19	—	—	11,154	46.87	1,818	7.64	2,239	9.41	7,098	29.83	15	0.06
—	—	1	0.00	15,760	52.85	1,398	4.69	1,170	3.92	9,705	32.55	270	0.91
1,222	1.19	190	0.18	68,587	66.67	3,759	3.65	6,731	6.54	18,017	17.51	153	0.15
107	0.09	63	0.05	77,276	61.87	1,929	1.54	3,003	2.40	39,342	31.50	39	0.03
2,818	2.35	514	0.43	43,307	36.08	6,472	5.39	14,319	11.93	42,469	35.38	157	0.13
169	0.14	35	0.03	82,188	65.95	3,286	2.64	3,281	2.63	25,505	20.47	534	0.43
713	0.93	13	0.02	45,281	59.22	2,619	3.43	2,303	3.01	21,888	28.63	177	0.23
443	0.43	20	0.02	52,809	51.31	5,272	5.12	8,314	8.08	28,744	27.93	445	0.43
5,472	0.84	835	0.13	369,448	56.69	23,337	3.58	37,951	5.82	175,965	26.99	1,505	0.23

Table 13 (Cont'd.)

FARINEO LAND USE HECTARAGES BY TOWNSHIP

	REFORESTATION	%	BUILT-UP	%	SWAMP/ MARSH	%	PITS & QUARRIES	%	TOPSOIL EXTRACTION	%	SOD FARMS	%
Dundas												
Matilda	155	0.58	161	0.61	10	0.04	27	0.10	—	—	122	0.46
Mountain	31	0.12	112	0.45	2,329	9.30	73	0.29	—	—	73	0.29
Williamsburgh	6	0.02	369	1.41	352	1.35	24	0.09	—	—	—	—
Winchester	55	0.22	370	1.47	35	0.14	86	0.34	—	—	—	—
Glengarry												
Charlottenburgh	228	0.64	533	1.50	331	0.93	21	0.06	—	—	—	—
Kenyon	192	0.57	106	0.32	442	1.32	87	0.25	—	—	—	—
Lancaster	37	0.15	232	0.93	3	0.01	18	0.08	—	—	—	—
Lochiel	86	0.28	288	0.93	—	—	25	0.08	—	—	—	—
Grenville												
Augusta	137	0.43	1,135	3.59	1,409	4.46	238	0.75	—	—	—	—
Edwardsburgh	146	0.47	443	1.43	1,248	4.03	35	0.11	11	0.04	101	0.33
South Gower	9	0.10	97	1.08	297	3.30	109	1.22	—	—	247	2.76
Oxford	282	1.07	439	1.67	1,741	6.63	99	0.38	—	—	—	—
Wolford	220	0.98	128	0.58	3,239	14.57	44	0.20	—	—	—	—
Prescott												
Alfred	78	0.43	200	1.09	1,006	5.49	44	0.24	4	0.02	488	2.66
Caledonia	272	1.43	35	0.18	3,009	15.85	4	0.02	8	0.03	—	—
E. Hawkesbury	64	0.27	196	0.83	2	0.01	32	0.14	12	0.05	—	—
W. Hawkesbury	18	0.14	845	6.50	24	0.18	91	0.71	38	0.29	—	—
Longueuil	2	0.02	485	5.27	6	0.08	58	0.63	—	—	—	—
N. Plantagenet	258	1.23	428	2.04	46	0.22	70	0.33	—	—	—	—
S. Plantagenet	280	1.36	145	0.70	20	0.10	18	0.09	—	—	—	—
Russell												
Cambridge	356	1.33	484	1.80	1,116	4.16	111	0.41	2	0.01	—	—
Clarence	171	0.58	515	1.73	230	0.77	65	0.22	12	0.05	—	—
Russell	38	0.19	468	2.35	—	—	110	0.55	20	0.10	—	—
Stormont												
Cornwall	43	0.15	2,585	9.31	189	0.68	361	1.30	16	0.06	19	0.07
Finch	565	2.62	135	0.63	—	—	82	0.38	5	0.02	—	—
Osnabruck	245	1.03	373	1.57	388	1.63	91	0.38	3	0.01	—	—
Roxborough	312	0.15	145	0.49	753	2.53	173	0.58	129	0.40	—	—
By County												
Dundas	247	0.24	1,012	0.98	2,726	2.66	210	0.20	—	—	195	0.19
Glengarry	543	0.43	1,159	0.93	776	0.62	151	0.12	—	—	—	—
Grenville	794	0.66	2,242	1.87	7,934	6.61	525	0.44	11	0.01	348	0.29
Prescott	972	0.78	2,334	1.87	4,113	3.30	317	0.25	62	0.05	488	0.39
Russell	565	0.74	1,467	1.92	1,346	1.76	286	0.37	34	0.04	—	—
Stormont	1,165	1.13	3,238	3.15	1,330	1.29	707	0.69	153	0.15	19	0.02
FARINEO Total	4,286	0.65	11,452	1.75	18,225	2.80	2,196	0.34	260	0.04	1,050	0.16

Table 13 (Cont'd.)
FARINEO LAND USE HECTARAGES BY TOWNSHIP

RECREATION	%	WATER	%	GRAND TOTAL	%
81	0.30	—	—	26,563	100.00
23	0.09	—	—	25,042	100.00
1,119	4.29	22	0.08	26,089	100.00
—	—	—	—	25,188	100.00
79	0.22	—	—	35,445	100.00
23	0.07	526	1.57	33,491	100.00
52	0.21	—	—	24,903	100.00
7	0.02	—	—	31,066	100.00
—	—	—	—	31,622	100.00
70	0.23	25	0.08	30,964	100.00
11	0.12	—	—	8,961	100.00
16	0.06	176	0.67	26,268	100.00
8	0.04	1,160	5.21	22,229	100.00
41	0.22	130	0.72	18,330	100.00
—	—	—	—	18,988	100.00
850	3.63	1	0.00	23,496	100.00
8	0.06	11	0.08	13,002	100.00
—	—	—	—	9,210	100.00
32	0.15	279	1.33	21,005	100.00
4	0.02	183	0.89	20,588	100.00
3	0.01	273	1.01	26,837	100.00
74	0.25	—	—	29,712	100.00
32	0.16	109	0.55	19,908	100.00
271	0.98	—	—	27,763	100.00
—	—	82	0.38	21,547	100.00
374	1.57	—	—	23,798	100.00
2	0.01	—	—	29,817	100.00
1,223	1.19	22	0.02	102,882	100.00
161	0.13	526	0.43	124,905	100.00
105	0.09	1,361	1.12	120,044	100.00
935	0.75	604	0.48	124,619	100.00
109	0.15	382	0.50	76,457	100.00
647	0.63	82	0.07	102,925	100.00
3,259	0.50	2,977	0.45	651,911	100.00

Figure 24
COMPUTER MAP OF RUSSELL TOWNSHIP

Table 14
LAND USE HECTARAGES INSIDE AND OUTSIDE THE SOUTH NATION RIVER WATERSHED

	INTENSIVE FARMING (P, C, M and H)		PASTURE & GRAZING (HG and G)		TOTAL AGRICULTURE		TILE DRAINED LAND	
	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside
Dundas								
Matilda	9,799	3,960	1,807	1,340	11,606	5,300	2,618	—
Mountain	16,880	—	713	—	17,593	—	3,582	—
Williamsburgh	5,719	2,973	1,675	1,208	7,394	4,181	1,281	12
Winchester	21,397	—	764	—	22,161	—	4,704	—
Total	53,795	6,933	4,959	2,548	58,754	9,481	12,185	12
Glengarry								
Charlottenburgh	—	18,323	—	2,061	—	20,384	—	2,549
Kenyon	5,749	8,209	1,024	476	6,773	8,685	930	836
Lancaster	—	17,380	—	976	—	18,356	—	4,891
Lochiel	—	19,767	—	3,217	—	22,984	—	2,597
Total	5,749	63,679	1,024	6,730	6,773	70,409	930	10,873
Grenville								
Augusta	5,592	2,620	943	1,430	6,535	4,050	454	109
Edwardsburgh	6,372	405	3,064	1,456	9,436	1,861	748	66
South Gower	2,042	1,526	163	93	2,205	1,619	46	36
Oxford-on-Rideau	805	8,136	641	758	1,446	8,894	—	590
Wolford	—	4,661	—	2,068	—	6,729	—	287
Total	14,811	17,348	4,811	5,805	19,622	23,153	1,248	1,088
Prescott								
Alfred	3,065	6,928	168	3,197	3,233	10,125	71	187
Caledonia	9,650	1,902	631	907	10,281	2,809	1,071	56
East Hawkesbury	—	13,735	—	2,498	—	16,233	—	501
West Hawkesbury	—	4,717	—	2,110	—	6,827	—	191
Longueuil	—	6,062	—	740	—	6,802	—	495
North Plantagenet	8,771	766	868	524	9,639	1,290	99	26
South Plantagenet	13,656	—	915	—	14,571	—	1,580	—
Total	35,142	34,110	2,582	9,976	37,724	44,086	2,821	1,456
Russell								
Cambridge	13,033	—	1,223	—	14,256	—	1,617	—
Clarence	13,399	—	2,368	—	15,767	—	468	—
Russell	14,604	—	685	—	15,289	—	2,204	—
Total	41,036	—	4,276	—	45,312	—	4,289	—
Stormont								
Cornwall	—	5,025	—	3,225	—	8,250	—	447
Finch	15,637	—	1,376	—	17,013	—	3,547	—
Osnabruck	1,672	5,842	584	3,052	2,255	8,894	123	109
Roxborough	12,565	2,214	523	556	13,089	1,658	1,311	51
Total	29,874	13,081	2,483	6,833	32,357	18,802	4,981	607
By County								
Dundas	53,795	6,933	4,959	2,548	58,754	9,481	12,185	12
Glengarry	5,749	63,679	1,024	6,730	6,773	70,409	930	10,873
Grenville	14,811	17,348	4,811	5,805	19,622	23,153	1,248	1,088
Prescott	35,142	34,110	2,582	9,976	37,724	44,086	2,821	1,456
Russell	41,036	—	4,276	—	45,312	—	4,289	—
Stormont	29,874	13,081	2,483	6,833	32,357	19,914	4,981	607
FARINEO Total	180,407	135,151	20,135	31,892	200,542	167,043	26,454	14,036
Total Intensive Farming		315,558						
Total Pasture & Grazing				52,027				
Total Agriculture						367,585		
Total Tile Drained Land								40,490

Table 15

SOUTH NATION RIVER BASIN — LAND CLASSIFICATION SUMMARY (by sub-basins)

LAND CLASS & SUB-CLASS	UPPER SOUTH NATION		CASTOR		BEAR BROOK		PAYNE RIVER		SCOTCH RIVER		LOWER SOUTH NATION		TOTAL BASIN	
	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%
1	35,531	13.9	33,107	17.6	2,791	2.3	2,546	5.4	3,867	5.6	11,183	3.9	89,025	9.2
2w	48,822	19.1	20,469	10.9	2,453	2.0	8,819	18.7	5,204	7.6	53,380	18.7	139,147	14.4
2p	56	0.0	780	0.4	439	0.4	—	—	—	—	—	—	1,275	0.1
2d	4,390	1.7	330	0.2	5,538	4.6	6,327	13.4	2,639	3.8	12,029	4.2	31,253	3.2
2f	301	0.1	32,196	17.0	11,143	9.2	—	—	2,813	4.0	9,309	3.3	55,762	5.8
2fm	2,334	0.9	656	0.3	—	—	154	0.3	—	—	592	0.2	3,736	0.4
2fw	—	—	—	—	—	—	—	—	—	—	1,035	0.4	1,035	0.1
sub totals	55,903	21.8	54,431	28.8	19,573	16.2	15,300	32.4	10,656	15.4	76,345	26.8	232,208	24.0
3f	34,766	13.6	4,909	2.6	3,353	2.8	2,916	6.2	5,486	7.9	4,469	1.6	55,899	5.8
3w	13,620	5.3	12,002	6.4	26,485	22.0	1,121	2.4	18,617	26.7	53,403	18.8	125,248	13.1
3s	63	0.0	—	—	—	—	—	—	—	—	—	—	63	0.0
3d	12,155	4.7	—	—	—	—	5,664	12.0	—	—	9,227	3.2	27,046	2.8
3r	5,860	2.3	—	—	—	—	—	—	1,734	2.5	929	0.3	8,523	0.9
3p	15,126	6.0	15,058	8.0	2,698	2.2	3,424	7.3	7,799	11.2	7,960	2.8	52,065	5.4
3l	419	0.2	—	—	—	—	—	—	—	—	—	—	419	0.0
3fm	—	—	—	—	—	—	—	—	—	—	126	0.0	126	0.0
sub totals	82,009	32.1	31,969	17.0	32,536	27.0	13,125	27.9	33,636	48.4	76,061	26.7	269,336	28.0
4w	2,870	1.1	258	0.1	—	—	1,223	2.6	92	0.1	1,333	0.4	5,776	0.6
4f	196	0.1	3,931	2.1	3,578	3.0	—	—	2,823	4.1	15,000	5.3	25,528	2.6
4s	233	0.1	957	0.5	101	0.1	38	0.1	1,113	1.6	2,437	0.9	4,879	0.5
4r	151	0.1	6,157	3.3	6	0.0	—	—	—	—	—	—	6,314	0.7
4fm	12,592	4.9	6,138	3.3	16,738	13.9	5,072	10.8	7,786	11.2	25,457	8.9	73,783	7.6
4ws	—	—	512	0.3	24,349	20.2	—	—	—	—	17,785	6.3	42,646	4.4
sub totals	16,042	6.3	17,953	9.6	44,772	37.2	6,333	13.5	11,810	17.0	62,012	21.8	158,926	16.4
5w	30,538	11.9	22,244	11.8	334	0.3	4,305	9.1	2,064	3.0	5,368	1.9	64,853	6.7
5l	1,937	0.8	—	—	—	—	—	—	—	—	—	—	1,937	0.2
5p	845	0.3	—	—	—	—	—	—	—	—	73	0.0	918	0.1
5sw	—	—	—	—	13,447	11.2	—	—	—	—	8,769	3.1	22,216	2.3
5fm	139	0.1	—	—	—	—	—	—	—	—	—	—	139	0.0
sub totals	33,459	13.1	22,244	11.8	13,781	11.5	4,305	9.1	2,064	3.0	14,210	5.0	90,063	9.3
6w	188	0.1	—	—	—	—	—	—	—	—	—	—	188	0.0
6p	162	0.1	4,396	2.3	603	0.5	60	0.1	526	0.7	3,602	1.3	9,349	1.0
6r	9,370	3.8	3,588	1.9	1,694	1.4	—	—	142	0.2	1,513	0.5	16,307	1.7
6wp	—	—	349	0.2	—	—	—	—	—	—	502	0.2	851	0.1
6wf	—	—	—	—	297	0.2	—	—	799	1.1	6,093	2.1	7,189	0.7
sub totals	9,720	4.0	8,333	4.4	2,594	2.1	60	0.1	1,467	2.1	11,710	4.1	33,884	3.5
7p	—	—	—	—	—	—	—	—	259	0.4	16	0.0	275	0.0
0	23,318	9.1	20,552	10.0	4,455	3.7	5,460	11.6	5,714	8.2	31,823	11.2	91,322	9.4
water	—	—	—	—	—	—	—	—	—	—	1,361	0.5	1,361	0.1
Totals	255,982	26.49	188,589	19.50	120,502	12.47	47,129	4.88	69,477	7.19	284,721	29.46	966,400	99.9

other FARINEO counties, the shallow soils on the limestone plains may explain the smaller amount of agricultural activity in this county. The large amount of land used for agriculture overall emphasizes the importance of this activity to the six-county region.

The land use systems quantify the amount of land in agricultural use. The number of hectares of each land use system are summarized in Table 13. These totals were calculated from the computerized land use maps.

By using the land use systems information as a scale of the intensity of land use, combined with the CLI soil capability for agriculture, an assessment of the degree of land utilization can be made. Areas of underutilized land (intensity of agriculture is less than the capability of the land) and overutilized land (intensity of agriculture is greater than the capability of the land) can be located, quantified and qualified. With the addition of the drainage information, areas requiring special study of the drainage, erosion or crop production characteristics could also be located, qualified and quantified.

The South Nation River Basin Study used the FARINEO land use maps to calculate the number of hectares of each land use system or type both inside and outside the river basin (Table 14) and the number of hectares of tile-drained land. Although 367,585 hectares (908,303 acres) of the FARINEO area are used for agriculture, only 40,490, hectares (100,050 acres) or 11% of this area is tile drained. Within the basin, there are 159,175 hectares (393,323 acres) of CLI class 2w, 3w, 4w, 5w, 2d and 3d lands — lands which require drainage improvements (Table 15).

6.2 FOREST LANDS IN EASTERN ONTARIO

Forest occupies the second largest area of land in the six counties, ranging from 46.24% in Kenyon Township to 10.18% in Mountain Township (Table 13). Farmland and woodland hectarages obtained from the 1980 assessment survey and the 1976 Census of Agriculture have been compared to the hectarages obtained by computerizing the FARINEO land use data. The comparison of farmland hectarages is provided in Table 16. They are relatively uniform. The small amount of fluctuation among these figures can be attributed to the differences in the methods of data collection. Woodland hectarages, however, fluctuate considerably among these three sources of information (Table 17).

Table 16

FARMLAND HECTARAGE COMPARISON

	FARINEO Study 1980	Assessment Survey 1980	Census 1976
Dundas	68,600	70,500	59,300
Glengarry	77,300	73,000	54,400
Grenville	43,300	48,300	32,500
Prescott	82,200	84,800	67,800
Russell	45,300	43,800	35,600
Stormont	52,800	57,000	43,100
Totals	369,500	377,400	292,700

Table 17

WOODLAND HECTARAGE COMPARISON

	FARINEO Study 1980	Assessment Survey 1980	Census 1976
Dundas	18,400	10,600	12,900
Glengarry	39,900	21,300	22,800
Grenville	43,400	24,500	21,900
Prescott	27,000	10,600	15,500
Russell	22,600	5,300	6,800
Stormont	30,400	18,300	17,100
Totals	181,700	90,600	97,000

Upon closer examination, the reason for the difference is apparent. FARINEO woodland includes all wooded areas which have a crown closure density of at least forty-five per cent, all reforested stands and pastured woodlots. The assessment survey and the Census only include woodlands which are part of farm properties, and ignore non-farm woodlots. Therefore, the number of hectares of forest reported by FARINEO is much higher than the statistics reported by the assessment survey and the Census.

The assessment survey figures were adjusted to include tree-covered non-farm land as well as farm woodlots. As illustrated in Table 18, this adjustment more closely corresponds to the total reported by FARINEO.

Table 18

REVISED WOODLAND HECTARAGE COMPARISON

	FARINEO Study 1980	Assessment Survey 1980 (woodland & vacant land)
Dundas	18,400	21,100
Glengarry	39,900	31,700
Grenville	43,400	47,400
Prescott	27,000	26,000
Russell	22,600	25,700
Stormont	30,400	32,400
Totals	181,700	184,300

The Hybrid Poplar program set out to identify the amount of idle or underutilized farm land which may be used for the production of hybrid poplar varieties. Table 13 shows that there are 23,337 hectares of land which has been idle for one to ten years (A1), and 37,951 hectares of land which has been idle for more than ten years (A2). This is the land to be considered for hybrid poplar production: 61,288 hectares. If the least intensive agricultural land use systems lands are included (grazing system), the total amount of land which may be considered for hybrid poplar production in Eastern Ontario is 66,760 hectares, or 10% of the total FARINEO area. Most of the idle land (A1 and A2) is located in Grenville County (20,800 hectares) and the townships west of Cornwall and along the St. Lawrence River (Figure 25).

6.3 COMPUTER APPLICATIONS

The computer can analyse the various types of information available through FARINEO (land use, forest lands, drainage, CLI, building codes). Users will be able to combine these data sets to produce "custom" maps showing specific information. For example, MNR has used the forest lands inventory to locate forest stands containing red pine and Scots pine as part of its forest maintenance program. The computer produced a map showing only the stands which include these two species. As with all FARINEO maps produced by the computer, the number of hectares of these forest stands was recorded in the margin of the map.

The FARINEO inventory could be useful for policy formulation and program monitoring. Computer analysis could identify areas which require special attention. Subsequent updates of the inventory information could be used to monitor the effectiveness of programs and policies initiated. The updates would also make it possible to monitor changes in crops and livestock. Trends could be identified from the observed changes, which in turn could be evaluated against existing policy. Policies or programs could then be amended as required.

Figure 25
COMPUTER MAP: IDLE AGRICULTURAL LAND — FARINEO AREA

MAALU

GRAZE	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 6364.
HAY	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 137177.
WOODL	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 185054.
WOODP	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 1767.
WOODR	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 10.
MIXED	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 118808.
IDLER	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 27720.
WATER	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 2764.
IDLES	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 43325.
SODFM	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 1103.
SPAGR	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 1092.
WETLD	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 18954.
BUILT	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 12117.
CORN	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 54580.
MONOC	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 13994.
REFOR	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 4420.
PITQU	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 2707.
EXTRA	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 215.
RECRN	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 3390.
PASTR	-	TEST DESCRIPTION FOR PLOT.	-	AREA IN HECTARES = 47267.

7
CONCLUSION

FARINEO is a comprehensive land resource survey using agricultural land use systems. This method has been adapted to other areas of the province: the Regional Municipality of Ottawa-Carleton and Niagara, the Stratford-Avon River watershed and Southwestern Ontario. The land use systems approach is workable and well suited to map present land use in Ontario.

By amending the land use legend to accommodate local differences in agriculture, all agricultural areas of the province could be mapped using the same basic legend. These maps would show the geographic distribution and the intensity of agricultural land use. This would create a new type of information base which, when related to soil capability for agriculture, would show how the soil resource is being used.

The systems approach to land use mapping produces maps which are current for several years. Although the crops growing in each field may change annually, the overall proportion of crops within each system would not change significantly. Thus the level of intensity of agricultural use within each system will remain the same from year to year. Obviously, if a farmer initiates a new rotation this change would show on an update of the inventory. This update would monitor such changes and provide data that would allow us to measure production trends.

An important component of the analysis of this survey is the computer. By overlaying data themes, areas in agricultural use can be located geographically, quantified by the hectarage totals and qualified as to how intensively the land is used for agriculture. The computer is able to overlay the data themes and plot maps which show specific data set combinations at virtually any scale.

FARINEO has established new types of information (land use, farm building codes, tile drainage and forest lands), and includes components which have been in existence for some time (soil surveys and CLI). Each component exists independent of the others and can be used separately. When the components are combined a new, more complex, data base is created. The relationships which emerge as a result of this combination may point to situations which require special attention, and may help to develop new policies and programs for agriculture.

To keep the maps accurate and current, the land use and drainage information should be updated. A system for updating the drainage inventory is already in place. Drainage contractors return completed Drain Record Forms to the Food Land Development Branch in Toronto. The new areas of tile drainage as reported by the Contractors are then drafted onto the drainage maps. The computer drainage maps are subsequently edited to include these newly drained areas.

By using the same or a similar land use legend when updating the land use maps, similarities and changes in agriculture in these six counties could be identified. Changes are likely to occur in three to five years following the original survey. That is, a corn system may change to a monoculture system or vice versa, or a hay may change to a mixed system, although the systems boundaries would likely remain the same because these boundaries often reflect the ownership pattern.

There may be some reservations about the accuracy and consistency of the FARINEO land use maps. These maps are as accurate and objective as they possibly can be. Each land use team member tried to maintain a high degree of accuracy and consistency by conferring frequently with the other team members. A small amount of discrepancy is expected since there were twelve land use mappers, and the field work was conducted during three consecutive summers. However, most errors should be limited to designations being off by one system. That is, there may be mixed systems which should have been corn systems (or vice versa); or hay systems which should have been mixed systems (or vice versa). In general, though, the monoculture, corn, mixed and hay systems (high intensity use) are not confused with the pasture and grazing systems (low intensity use).

The FARINEO land use inventory is a new data base which can be added to the existing resource base information. It should be considered as a new dimension which can be used in conjunction with the soil surveys and the CLI rather than replacing them. The CLI maps were included as part of the FARINEO survey to encourage the use of these data bases together.

The land use maps provide information for effective policy and program development on a regional scale. They are not intended for site planning or the management of specific parcels or land.

FARINEO has provided land resource information for the South Nation River Basin Study and the New Forests in Eastern Ontario program. It is hoped and expected that other decision-making agencies will make use of this data which locates, quantifies and qualifies the forestry and agricultural resources for this most eastern portion of the Province.

7.1 AVAILABILITY OF INFORMATION

The following information is on file and available at:

Food Land Development Branch
Ontario Ministry of Agriculture and Food
801 Bay Street, 6th Floor
TORONTO, Ontario
M7A 2B2

7.1.1 Land Use

— 1:30,000 and 1:36,000 air photos with field notes on mylar overlays
— 1:50,000 scale line maps
— computerized land use maps

7.1.2 Forestry

— 1:30,000 and 1:36,000 scale air photos with field notes (these are the same photos as were used for the land use inventory)
— 1:25,000 scale forest map for each township
— one set of forest lands inventory index cards for each township
— computerized forest lands maps for each township

7.1.3 Drainage

— 1:25,000 Artificial Drainage systems maps for the 27 FARINEO townships showing fields where tile drainage exists.
— 1:25,000 Artificial Drainage system maps for Southwestern Ontario
— blank copies of the Drain Record Form

7.1.4 CLI/Soils

— soil survey reports for counties in the FARINEO area
— 1:50,000 working copies of CLI capability for agriculture maps
— 1:25,000 soils and CLI maps for each township
— generalized 1:1,000,000 CLI maps for agriculture and forestry for Ontario

7.1.5 Building Codes

— farm building codes index cards for each township. This information will be digitized as necessary

All computerized maps (including derived maps) will be made available at nominal cost.

The drainage 1:10,000 scale air photos and drainage inventory index cards are on file at the office of the local agricultural engineer. The OMAF Extension Branch office in each county has copies of the land use and drainage maps for their county.

REFERENCES

Anslow, P. "The Forestry Situation in Eastern Ontario", in *Working Towards a Future — Eastern Ontario Workshop Report.* ed. Ontario Regional Committee. Ottawa: Canadian Council on Rural Development, 1978.

Bonuzzi, V. "Method Changes in the Classification of Types of Farming" in *Agricultural Typology and Land Utilization.* ed. Centre of Agricultural Geography, Institute of Agricultural Economy and Policy, University Academy of Agricultural Sciences and Humanities. Verona: Centre of Agricultural Geography, 1972.

Brown, D.M. McKay, G.A. and Chapman, L.J. *The Climate of Southern Ontario — Climatological Studies No. 5.* Toronto: Environment Canada, Atmospheric Environment Service, 1980.

Amendment No. 1 "Canada-Ontario Subsidiary Agreement for Community and Rural Resource Development" Schedule 'B'. Toronto: 1978 (Mimeographed).

Chapman, L.J. and Putnam, D.F. *The Physiography of Southern Ontario.* Second edition, Toronto: Ontario Research Foundation, 1966.

Clayton, J.S. et al. *Soils of Canada,* Ottawa: Research Branch, Agriculture Canada, 1977.

Department of Regional Economic Expansion. *The Canada Land Inventory: Objectives, Scope and Organization: Report No. 1.* 2nd Ed. Ottawa: Department of Regional Economic Expansion, 1970.

Environment Canada Lands Directorate. *Canada Land Inventory — Soil Capability for Agriculture. 1:1,000,000 Map Series, Ontario.* Ottawa: Environment Canada, Lands Directorate, 1975.

Environment Canada Lands Directorate. *Canada Land Inventory — Land Capability for Forestry. 1:1,000,000 Map Series, Ontario.* Ottawa: Environment Canada, Lands Directorate, 1975.

Food Land Development Branch. "Reference Information Re. the Forestry Agricultural Resource Inventory in Eastern Ontario". Toronto: 1980 (Mimeographed).

Food Land Development Branch. "Reference Information re. the Forestry Agricultural Resource Inventory in Eastern Ontario". Toronto: 1979 (Mimeographed).

Food Land Development Branch. "Reference Information re. the Forestry Agricultural Resource Inventory in Eastern Ontario". Toronto: 1978 (Mimeographed).

Huffman, Ted. "Agricultural Land Use Mapping". Ottawa: Report presented to the Soil Survey Committee Meeting, 1979 (Mimeographed).

Johnson, W.M. "Identifying Prime Food and Fibre Lands" in *Land Use: Tough Choices in Today's World.* ed. Soil Conservation Society of America, Ankeny: Soil Conservation Society of America, 1977.

Mage, J.A. *Studies in Rural Adjustment: Report No. 8: Development of a Scheme of Agricultural Typology for Canadian Conditions.* Guelph: Department of Geography, University of Guelph, 1979.

Matthews, B.C. and Richards, N.R. *Soil Survey of Dundas County.* Guelph: Experimental Farms Service, Canada Department of Agriculture and the Ontario Agricultural College, 1952.

Matthews, B.C., Richards, N.R. and Wicklund, R.E. *Soil Survey of Glengarry County.* Guelph: Experimental Farms Service, Canada Department of Agriculture and the Ontario Agricultural College, 1957.

Matthews, B.C. and Richards, N.R. *Soil Survey of Stormont County.* Guelph: Experimental Farms Service, Dominion Department of Agriculture and the Ontario Agricultural College, 1954.

McCullough, J.W. "An Overview of Eastern Ontario Agriculture" in *Working Towards a Future — Eastern Ontario Workshop Report.* Ed. Ontario Regional Committee. Ottawa: Canadian Council on Rural Development, 1978.

Ontario Centre for Remote Sensing. "Proposal for Agricultural Land Use Mapping of Ontario Using Digital Image Analysis Techniques". Toronto: 1981 (Mimeographed).

Ontario Regional Committee. *Working Towards a Future — Eastern Ontario Workshop Report, October 19-21, 1977, Perth, Ontario.* Ottawa: Canadian Council on Rural Development, 1978.

Rees, W.E. *The Canada Land Inventory in Perspective.* Ottawa: Fisheries and Environment Canada, Lands Directorate, 1977.

Richards, N.R., Matthews, B.C. and Morwick, F.F. *Soil Survey of Grenville County.* Guelph: Experimental Farms Service, Dominion Department of Agriculture and the Ontario Agricultural College, 1949.

Ross, Doug. "FARINEO — A Present Land Use Survey". Waterloo: Work Report Submitted to C. Bryant, 1980 (Mimeographed).

Scace, R.C. *Land Use Classification Systems: An Overview. Working Paper 14,* Ottawa: Environment Canada, Lands Directorate, 1981.

Select Standing Committee on Agriculture. *Inventory of Agricultural Land Reserves in British Columbia.* Victoria: Select Standing Committee on Agriculture, 1978.

Soil Research Institute. "Land Use Mapping". Ottawa: Soil Research Institute, Agriculture Canada, 1977 (Mimeographed).

South Nation River Conservation Authority. "Terms of Reference for the Agricultural Component Background Study". Berwick: 1980 (Mimeographed).

Spelt, J. "Southern Ontario" in *Canada: A Geographical Interpretation,* ed. J. Warkentin. Toronto: Methuen, 1968.

Thomas, H.F. "Establishing the Land Use Data Base" in *Land Use: Tough Choices in Today's World,* ed. Soil Conservation Society of America. Ankey: Soil Conservation Society of America, 1977.

Turabian, K.L. *A Manual For Writers of Term Papers, Theses and Dissertations.* 4th Edition. Chicago: University of Chicago Press, 1973.

Vink, A.P.A. *Land Use in Advancing Agriculture.* New York: Springer Verlag, 1975.

Webber, L.R. & Hoffman, D.W. *Origin, Classification & Use of Ontario Soils,* Guelph: Department of Soil Science, Ontario Agricultural College, University of Guelph & Ontario Department of Agriculture & Food.

Wickland, R.E. and Richards, N.R. *Soil Survey of Russell and Prescott Counties.* Guelph: Research Branch, Canada Department of Agriculture and the Ontario Agricultural College, 1962.

APPENDICES

APPENDIX 1

AMENDMENT No. 1

CANADA-ONTARIO SUBSIDIARY AGREEMENT COMMUNITY AND RURAL RESOURCE DEVELOPMENT SCHEDULE "B"

New Forests in Eastern Ontario

The forestry sector in Eastern Ontario is currently operating at a level below its potential due to an inadequate level of support for forest management following significant shifts in the agricultural use of land. Some of the existing forests in the Region are of generally poor quality as a result of exploitation over the past 200 years. The area is characterized by good climatic conditions and there is a rural population able to supply the required labour for forest industry development. It is located close to potential market areas in the Quebec-Windsor axis and in the eastern United States. The low quality hardwood forest renewal project and the successful development of new hybrid poplar products involving a new source of marketable pulpwood, a potential new source of animal fodder, and feed stock for the production of alcohols for energy could offer almost immediate benefits to Eastern Ontario. In addition, substantial acreages of non-productive land currently held by small landowners could be put to productive use resulting in significant additional income for the area as a result of this project.

The New Forests in Eastern Ontario program, involving projects outlined in Schedules 'A' and developed by the Ontario Ministry of Natural Resources, is a first step in a longer process of improving economic development opportunities in Eastern Ontario. The proposed measures reflect the activities required to meet the program's goals and objectives based on current information and data. It is intended, however, that this Agreement be reviewed from time to time as additional information is developed, in order to reflect necessary changes to the program's goals and objectives as well as related project activities.

Project Details

1. HYBRID POPLAR DEVELOPMENT

(a) Technological Development

The aim of this program is to develop and expand technology for hybrid poplar culture using industrial style plantations to maximize biomass production per unit area for energy, fibre and food. The program is designed to solve technical and operational problems during the period 1978-83 which are hindering an expanded program for future years, and develop an operational program suitable for private lands, industrial lands and Crown lands during the five-year period following this Agreement. It is proposed that the hybrid poplar planting program in Eastern Ontario concentrate on research, development and testing for the next 5 years (1978-83) at an annual level of approximately 600 acres per year in preparation for a major expansion.

(b) Hybrid Poplar Nursery

The success of the hybrid poplar program in Ontario depends very heavily on having a continuous supply of good quality cuttings in large quantities, available early each spring. In order to grow these, it is necessary to have good quality nursery land adjacent to an abundant water supply.

In addition the land must be close to the existing G. Howard Ferguson Nursery at Kemptville, Ontario, from which guidance and direction will be provided. The existing nursery is designed primarily for the production of conifers and has insufficient high quality land suitable for hybrid poplar production.

2. HARDWOOD FOREST RENEWAL

In Ontario's eastern planning region there are approximately 1,846,590 acres of existing forest. Approximately 44% or 812,499 acres of this forest consists of low quality hardwood stands. While some markets exist for low quality timber they are some distance from the wood supply. Because of the high operating and transportation costs compared to the value at millside it cannot be harvested at even a minimum profit. In addition, these defective, inferior stems are occupying land which is capable of producing high quality hardwood saw timber, for which a ready market exists.

This project will permit harvesting of the poor quality material, and at the same time make the productive sites available for growing better quality stems for the future. The harvesting and sale of the forest products will be carried out under the direction of the Ministry of Natural Resources.

In addition to upgrading the quality of the stands and providing much needed wood fibre for Eastern Ontario mills, other benefits will also be achieved including the stimulation of local economies in the small rural communities adjacent to the forest. Also, an example will be set for small private forest operators to follow if it can be demonstrated that a profit can be made when these low grade stands are improved.

Considerable income could be generated by this project. Any shareable revenue from the project during the term of this Agreement shall be divided between Canada and the Province in the same proportion as the respective shared costs of Canada and the Province related to this project.

3. FORESTRY AND AGRICULTURAL RESOURCE INVENTORY

A resource inventory of the present land use, agricultural, forest and woodlot cover and other uses, within the study area will be conducted. The study area being the United Counties of Stormont, Dundas and Glengarry, the United Counties of Prescott and Russell, the Grenville portion of the United Counties of Leeds and Grenville and the Regional Municipality of Ottawa-Carleton. This will be an inventory of the use being made of the land at the present time. Further study of specific areas, identified as a result of this initial study, may be needed in order to identify soil problems, drainage and economic viability of alternative uses. The aim of the inventory will be to provide the resource data upon which recommendations would be based for the optimization of agricultural and forestry production in Eastern Ontario.

The inventory program will be administered by the Ministry of Agriculture and Food. The Ministry of Natural Resources will co-operate in the implementation of this survey by providing guidance and expertise in the implementation of the forestry component. At the present time under the Employment Incentive Program an inventory of municipal and farm drainage is being prepared from municipal records.

This inventory will be carried out as a data gathering program related to two projects: the South Nation project and the Hybrid Poplar project.

4. HYBRID POPLAR RESEARCH

The objective of this project is to facilitate research that will allow a more complete utilization of the potential of the hybrid poplar program, and contribute significantly to its operational success.

APPENDIX 2

AGRICULTURAL LAND USE MAPS

AGRICULTURAL LAND USE SYSTEMS

CODE*	LAND USE SYSTEM	DESCRIPTION
A) Intensive Agriculture:		
MONOC	Monoculture	A contiguous arrangement of four or more fields or a minimum of 16 hectares of corn or small grains.
CORN	Corn	A continuous arrangement of four or more fields of uniform size. 40-75% of the area is corn, the remainder is a mixture of hay, pasture and sometimes grain.
MIXED	Mixed	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
HAY	Hay	A contiguous arrangement of four or more fields with a mixture of hay, grain and pasture, the largest portion being hay.
B) Non-Intensive Agriculture:		
PASTURE	Pasture	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
GRAZING	Grazing	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent or native grass pasture, or a combination. It may have minor amounts (less than 10%) of hay.

NON-AGRICULTURAL LAND USES

IDLE 1	Idle Agricultural Land	Land idle for 1-10 years and in a state of reversion to natural vegetation.
IDLE 2	Idle Agricultural Land	Land idle for more than 10 years and supporting native vegetation.
FOREST	Woodland	Forest cover with a minimum of 45% crown closure density and not less than 1/2 hectare in area.
PASTURED FOREST	Pastured Woodland	Woodlands that are grazed by livestock.
REFORESTATION		Land supporting a stand of artificially stocked trees.
BUILT UP	Built Up	Urban related uses.
SWAMP/MARSH		Supports vegetation characteristic of a depressed and poorly drained area.
PITS AND QUARRIES	Extraction	Sand and gravel pits and quarries.
TOPSOIL EXTRACTION	Extraction	Topsoil removal.
SOD FARMS	Sod Farms	Public or commercial sales.
RECREATION	Recreation	Parks, golf courses, campgrounds, etc.
SPECIAL AGRICULTURE	Specialty Agriculture	Orchards, market gardens, etc.
WATER	Water	Rivers, streams, lakes, etc.

* Codes are used in Table 13.

AGRICULTURAL LAND USE SYSTEMS

MATILDA TOWNSHIP DUNDAS COUNTY

ONTARIO

LEGEND

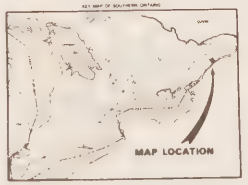
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 -75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	[illegible] FARM	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 6_1



The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Foodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources. Topographic Sheet(s) 31B/14, 31G/3 – 1:50,000

AGRICULTURAL LAND USE SYSTEMS

MOUNTAIN TOWNSHIP DUNDAS COUNTY

ONTARIO

LEGEND

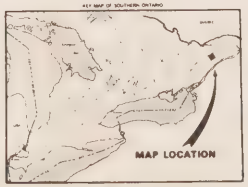
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 6-2



1:50,000

6-2

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Departments of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/4, 31G/3, 31B/13 31B/14 — 1:50,000

AGRICULTURAL LAND USE SYSTEMS

WILLIAMSBURG TOWNSHIP DUNDAS COUNTY

ONTARIO

LEGEND

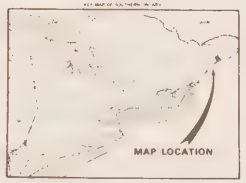
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc

MAP No. 6 - 3



The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Foodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31B/14, 31G/3, 1:50,000.

6 - 3

AGRICULTURAL LAND USE SYSTEMS

WINCHESTER TOWNSHIP DUNDAS COUNTY

ONTARIO

LEGEND

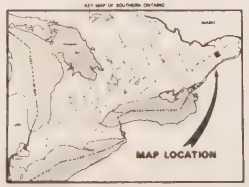
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 46% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 6-4



1 50,000

6-4

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement

This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Departments of Land Resource Sciences, University of Guelph, Guelph.

Base Map Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/3 — 1:50,000

AGRICULTURAL LAND USE SYSTEMS

CHARLOTTENBURGH TOWNSHIP GLENGARRY COUNTY

ONTARIO

LEGEND

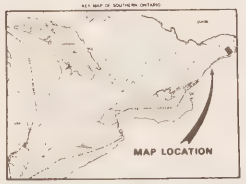
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size, 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 46% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal
Y	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 11-1



1:50,000

11-1

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Departments of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Departments of Land Resource Science, University of Guelph, Guelph.

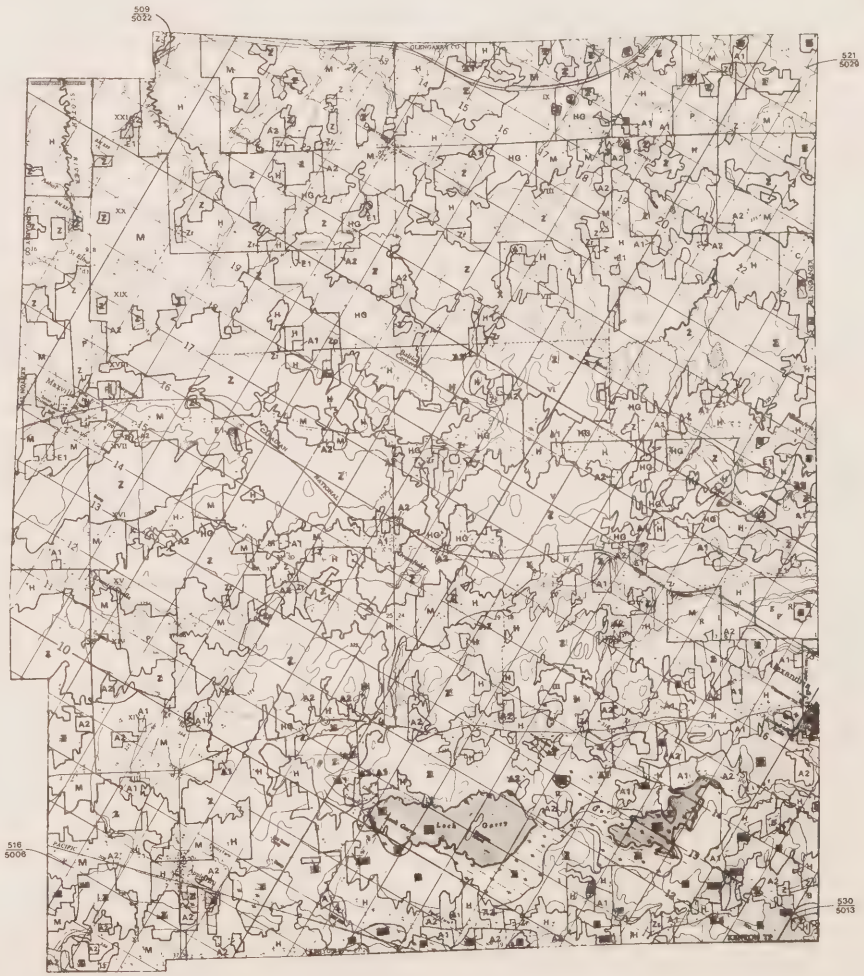
Base Map, Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/11, 31G/12, 31G/7—1:50,000

This publication may be quoted if credit is given to the Forestry Agricultural Resource Inventory in Eastern Ontario, 1978-9-80.

AGRICULTURAL LAND USE SYSTEMS

KENYON TOWNSHIP GLENGARRY COUNTY

ONTARIO



LEGEND

AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 11 - 2

1 50,000

11 - 2

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

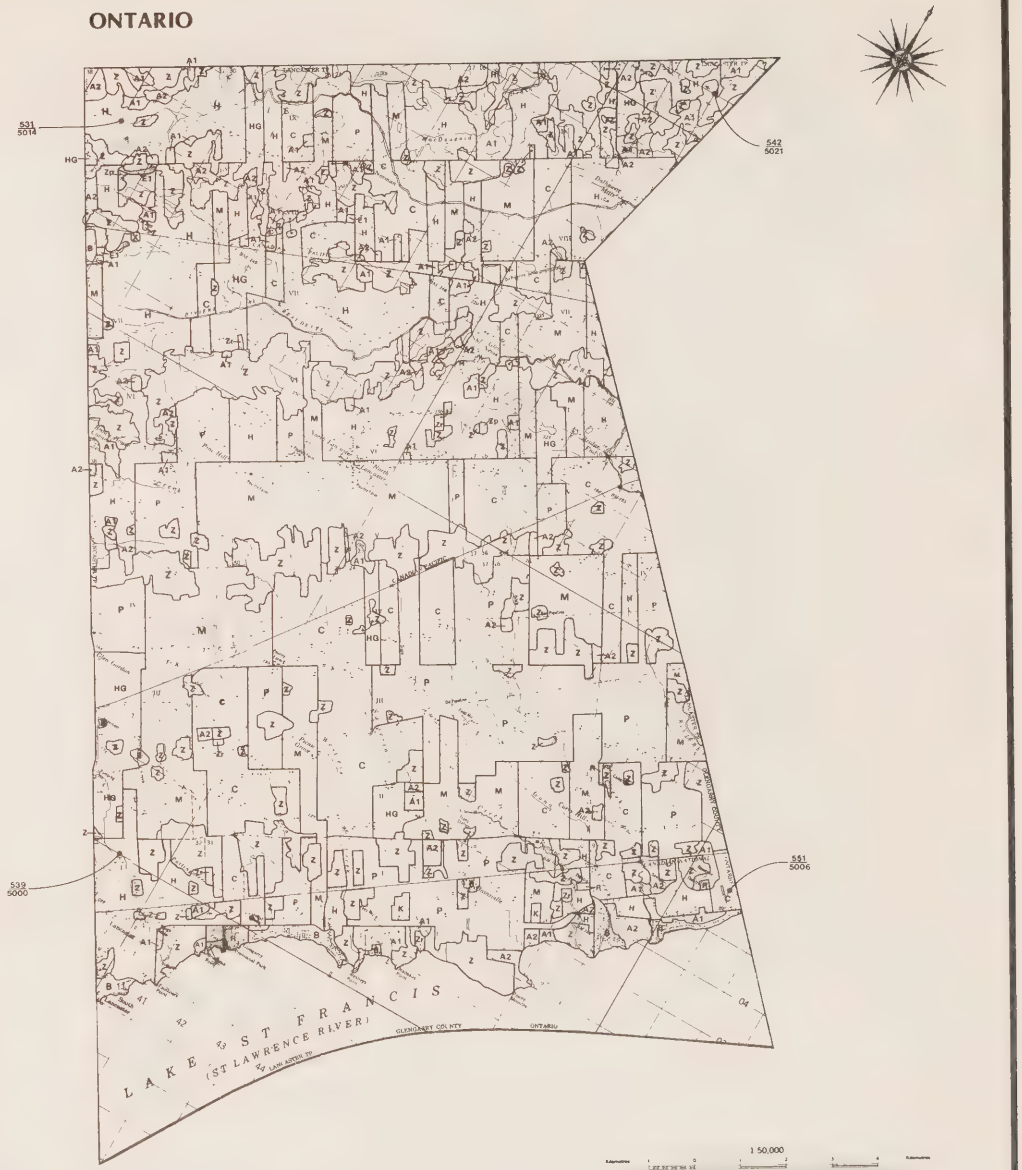
This map is published by the Foodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Sciences, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/13, 31G/12 1:50,000

AGRICULTURAL LAND USE SYSTEMS

LANCASTER TOWNSHIP GLENGARRY COUNTY

ONTARIO



LEGEND

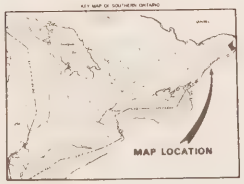
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 11-3



* The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Food Land Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map Department of Energy, Mines and Resources. Topographic Sheet(s) 31G/7, 31G/8, 31G/1 31G/2—1:50,000

11-3

AGRICULTURAL LAND USE SYSTEMS

LOCHIEL TOWNSHIP GLENGARRY COUNTY

ONTARIO

LEGEND

AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size, 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 11-4

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

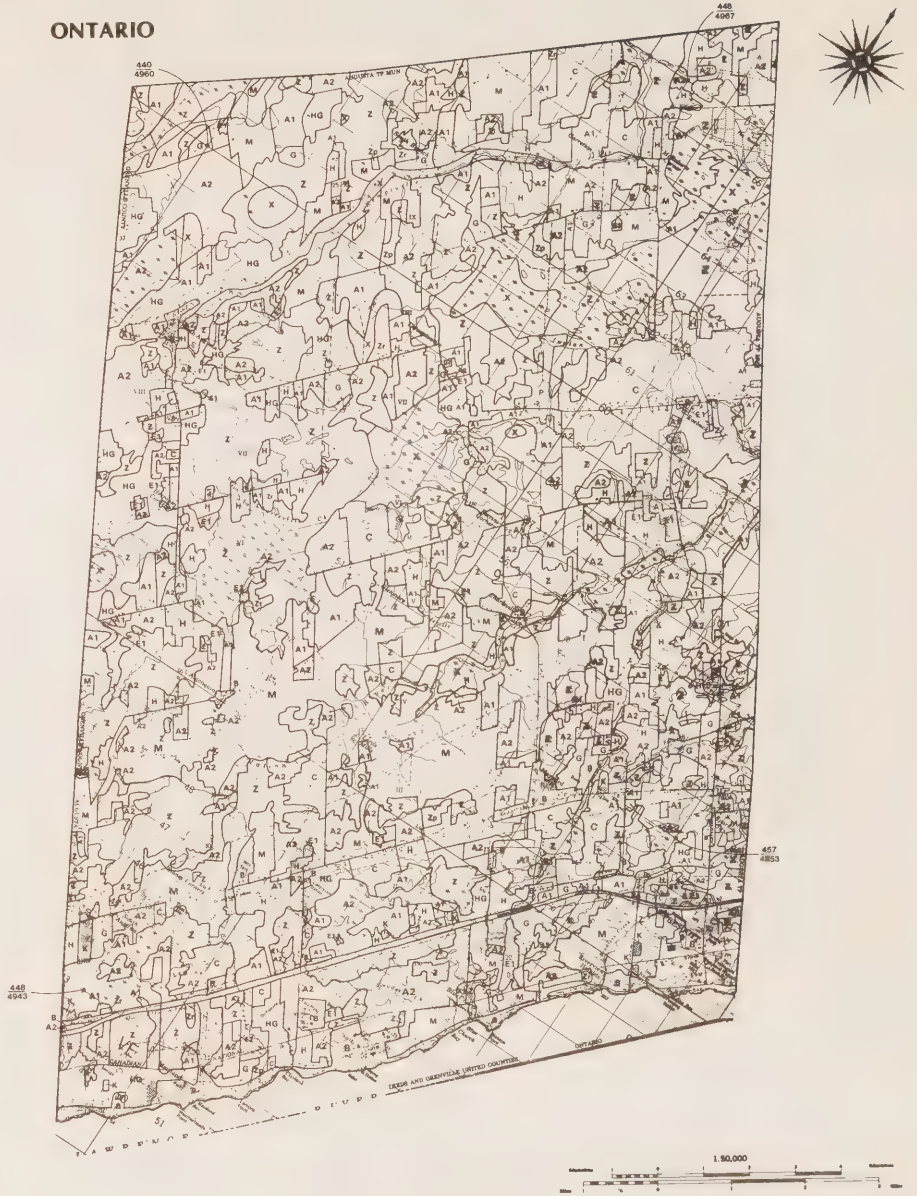
This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

11 - 4

AGRICULTURAL LAND USE SYSTEMS

AUGUSTA TOWNSHIP GRENVILLE COUNTY

ONTARIO



LEGEND

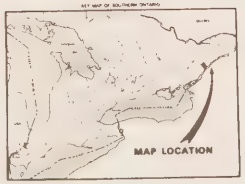
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 12-1



The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Developments Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the Inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

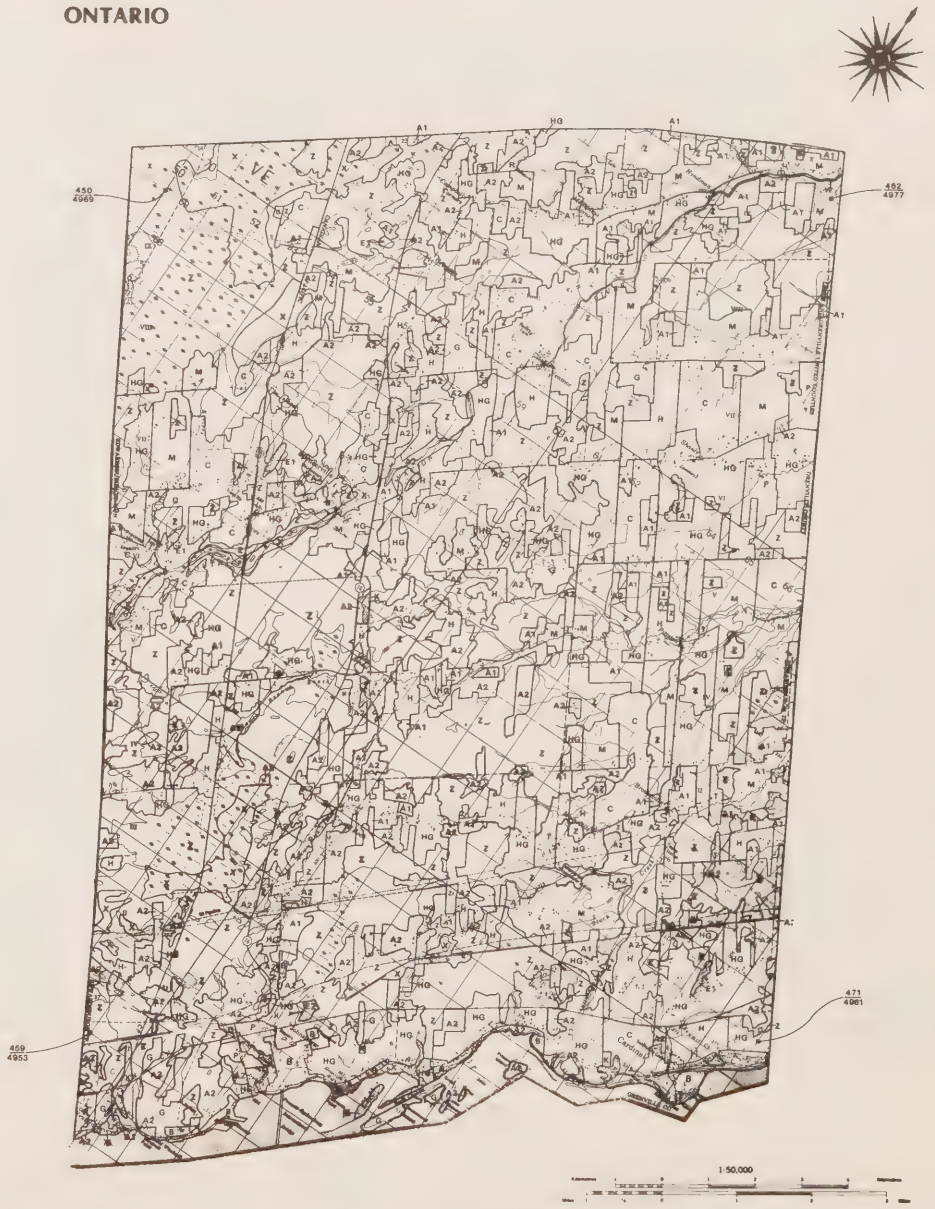
Base Map: Department of Energy, Mines and Resources. Topographic Sheet(s) 31B/12, 31B/13 — 1:50,000

12 - 1

AGRICULTURAL LAND USE SYSTEMS

EDWARDSBURG TOWNSHIP GRENVILLE COUNTY

ONTARIO



LEGEND

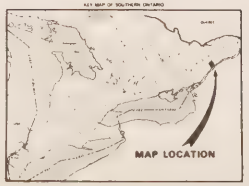
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size, 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 12-2



The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Rural Land Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the Inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31B/13, 31B/14, 31B/12, 31B/11 1:50,000

AGRICULTURAL LAND USE SYSTEMS

SOUTH GOWER TOWNSHIP GRENVILLE COUNTY

ONTARIO

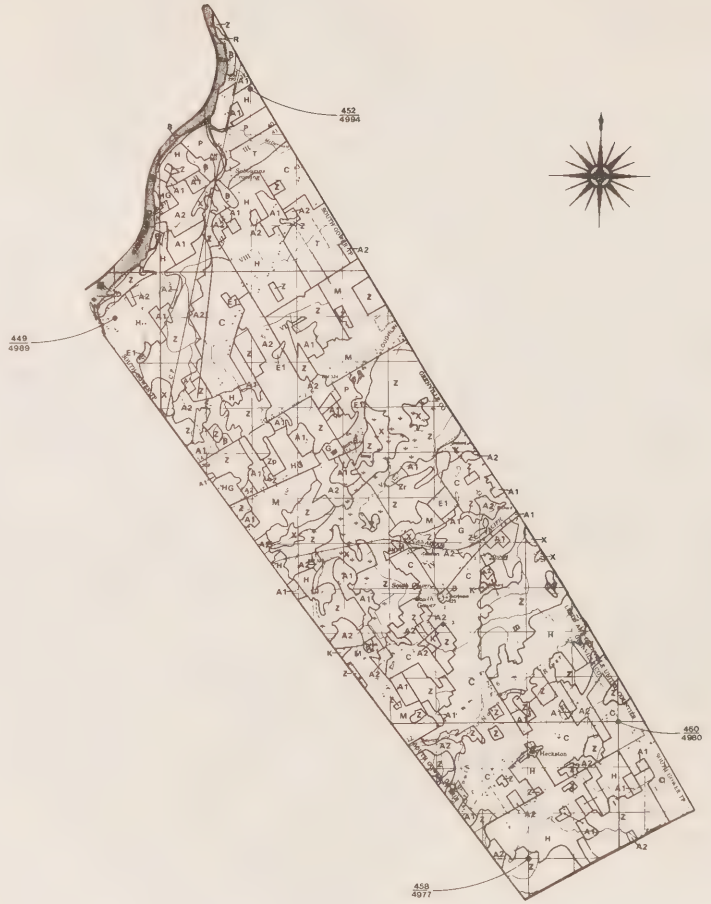
LEGEND

AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 46% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.



MAP No. 12-3

1 50,000

12-3

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Developments Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources. Topographic Sheet(s) 31G/4, 31B/13, 31B/14 - 1:50,000

AGRICULTURAL LAND USE SYSTEMS

OXFORD TOWNSHIP GRENVILLE COUNTY

ONTARIO

LEGEND

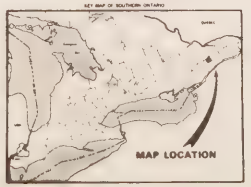
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
F	[illegible]RICULTURE	A contiguous arrangement of four or more fields.. or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 78% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 46% crown closure density and not less than half a hectare in area.
P	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
U	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
Y	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 12 - 4



The Forestry Agriculture resource inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

[illegible] is published by the Regional Development Branch, Ontario [illegible] Agriculture and Food and the Ministry of [illegible] Land Resource Institute, [illegible] the University. The cartography [illegible] Land Resource Science, University of [illegible]

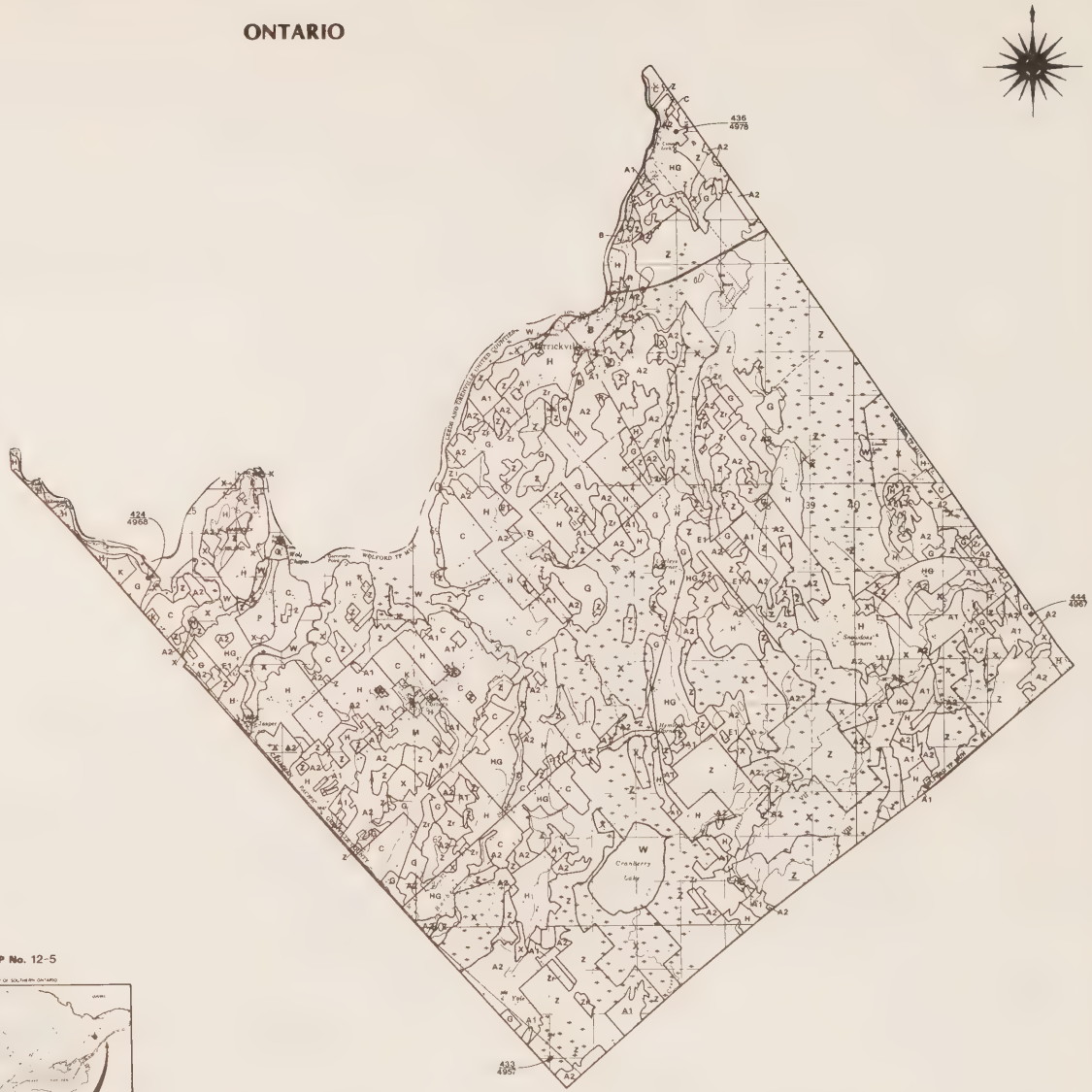
Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/13, 31G/14 - 1:50,000

12 - 4

AGRICULTURAL LAND USE SYSTEMS

WOLFORD TOWNSHIP GRENVILLE COUNTY

ONTARIO



LEGEND

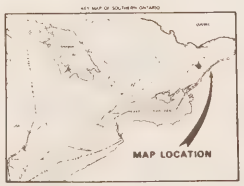
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 12-5



1:50,000

12-5

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31B/13 - 1:50,000

AGRICULTURAL LAND USE SYSTEMS

ALFRED TOWNSHIP PRESCOTT COUNTY

ONTARIO

LEGEND

AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 38-1

1 50,000

38-1

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy Mines and Resources Topographic Sheet(s) 31G/10, 31G/7 1:50,000

AGRICULTURAL LAND USE SYSTEMS

CALEDONIA TOWNSHIP — PRESCOTT COUNTY

ONTARIO

LEGEND

AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc
W	WATER	Rivers, streams, etc.

MAP No. 35 -2

1:50,000

38-2

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Foodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources: Topographic Sheet(s) 31G 10, 31G 7 - 1:50,000

AGRICULTURAL LAND USE SYSTEMS

EAST HAWKESBURY TOWNSHIP PRESCOTT COUNTY

ONTARIO

1:50,000

LEGEND

AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 38-3

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Foodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Departments of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources Topographic Sheet(s) 31G/10, 31F/7, 31G/15, 31G/8—1:50,000

AGRICULTURAL LAND USE SYSTEMS

WEST HAWKESBURY TOWNSHIP PRESCOTT COUNTY

ONTARIO

LEGEND

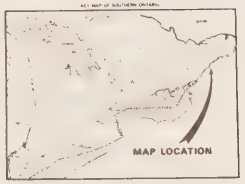
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 38-4



1:50,000

38-4

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Foodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/10, 31G/7, 1:50,000.

AGRICULTURAL LAND USE SYSTEMS

LONGUEUIL TOWNSHIP PRESCOTT COUNTY

ONTARIO

LEGEND

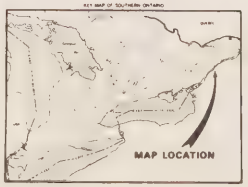
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 38-5



1 50,000

38-5

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/10—1:50,000

AGRICULTURAL LAND USE SYSTEMS

NORTH PLANTAGENET TOWNSHIP PRESCOTT COUNTY

ONTARIO

LEGEND

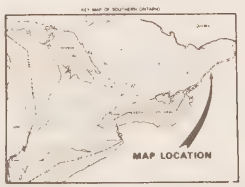
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 38-06



1:50,000

38 - 6

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map Department of Energy, Mines and Resources: Topographic Sheet(s) 31G/11, 31G/10, 31G 6, 31617 1:50,000

AGRICULTURAL LAND USE SYSTEMS

SOUTH PLANTAGENET TOWNSHIP PRESCOTT COUNTY

ONTARIO

LEGEND

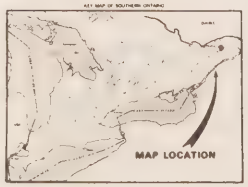
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size, 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	and idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 38:07



1:50,000

38-7

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreements.

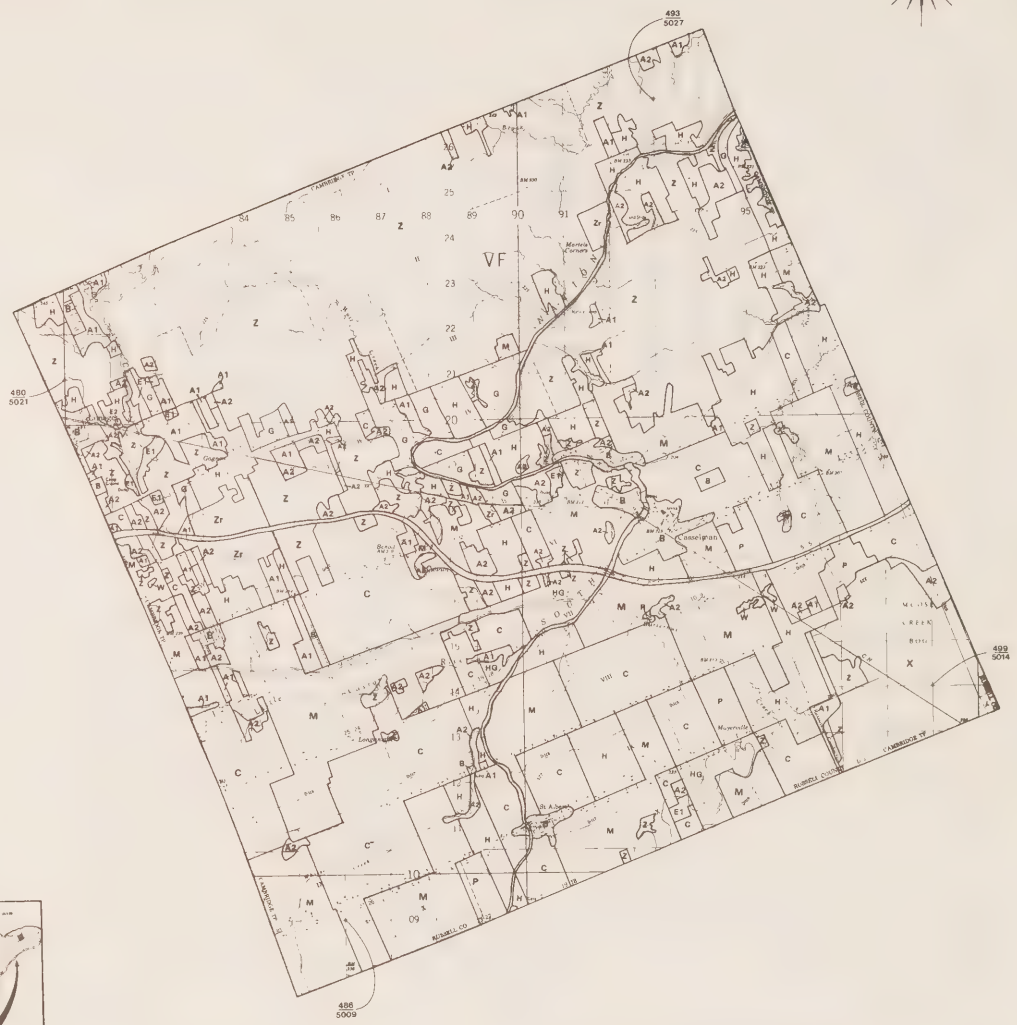
This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources "opographic Sheet(s) 31C/6, 31C/11 1:50,000

AGRICULTURAL LAND USE SYSTEMS

CAMBRIDGE TOWNSHIP RUSSELL COUNTY

ONTARIO



LEGEND

AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 42-1

1 50,000

1980 - 42-1

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Food and Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31G13, 31G16 1:50,000

AGRICULTURAL LAND USE SYSTEMS

CLARENCE TOWNSHIP RUSSELL COUNTY

ONTARIO

LEGEND

AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 46% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 42 - 2

1 50,000

42-2

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/8, 31G/11 - 1:50,000

AGRICULTURAL LAND USE SYSTEMS

RUSSELL TOWNSHIP RUSSELL COUNTY

ONTARIO

LEGEND

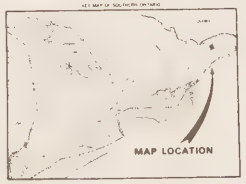
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 42-3



The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Focalland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Departments of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/3 31G/6 1:50,000

1:50,000

42-3

AGRICULTURAL LAND USE SYSTEMS

CORNWALL TOWNSHIP STORMONT COUNTY

ONTARIO

LEGEND

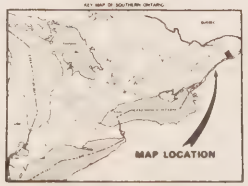
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 44-1



1:50,000

44-1

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Departments of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/3 – 1:50,000

AGRICULTURAL LAND USE SYSTEMS

FINCH TOWNSHIP STORMONT COUNTY

ONTARIO

LEGEND

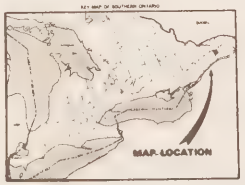
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
M	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
U	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area
E	EXTRACTION	Sand and gravel pits and quarries.
ET	EXTRACTION	Topsoil removal.
Y	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
S	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 44-2



1:50,000

1980 - 44 - 2

The Forestry Agricultural Resources Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Canada - Rural Resource Development Subsidiary Agreement.

It is published by the Woodland Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada, for their assistance with the inventory. The cartography was done for the Department of Land Resource Science, University of Guelph.

Base: Ontario Department of Energy, Mines and Resources, Topographic Sheet(s) 31G/13, 31G/12 — 1:50,000

AGRICULTURAL LAND USE SYSTEMS

OSNABRUCK TOWNSHIP STORMONT COUNTY

ONTARIO

LEGEND

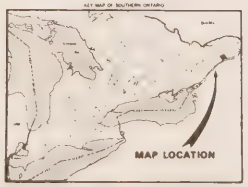
AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 16 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture.
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 16 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation
Z	WOODLAND	Forest cover with a minimum of 45% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc.
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 44-3



The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Community and Rural Resource Development Subsidiary Agreement.

This map is published by the Woodland Developments Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was completed by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources, Topographic Sheet(s) 31B/13, 31B/14, 31G/2, 31G/3 – 1:50,000

1980 - 44-3

AGRICULTURAL LAND USE SYSTEMS

ROXBOROUGH TOWNSHIP STORMONT COUNTY

ONTARIO

LEGEND

AGRICULTURAL LAND USE SYSTEMS

SYMBOL	LAND USE SYSTEM, TYPE	DESCRIPTION
P	MONOCULTURE	A contiguous arrangement of four or more fields, or a minimum of 18 hectares of corn or small grains.
C	CORN SYSTEM	A contiguous arrangement of four or more fields of uniform size. 40 - 75% of the area is corn, the remainder is a mixture of hay, pasture, and sometimes grain.
M	MIXED SYSTEM	A contiguous arrangement of four or more fields of uniform size. There must be some corn, but less than 40% of the area. The remainder is a mixture of hay, grain and pasture
H	HAY SYSTEM	A contiguous arrangement of four or more fields with a mixture of hay, grain, and pasture, the largest portion being hay.
HG	PASTURE SYSTEM	A contiguous arrangement of two or more fields with a mixture of hay and pasture, about equal quantities of each.
G	GRAZING SYSTEM	A contiguous arrangement of four or more fields or a minimum of 18 hectares with no field separation of either permanent pasture or native grass pasture, or a combination. It may have minor amounts (<10%) of hay.

NON-AGRICULTURAL LAND USE SYSTEMS

A1	IDLE AGRICULTURAL LAND	Land idle for 1-10 years and in a state of reversion to natural vegetation.
A2	IDLE AGRICULTURAL LAND	Land idle for more than 10 years and supporting native vegetation.
Z	WOODLAND	Forest cover with a minimum of 46% crown closure density and not less than half a hectare in area.
Zp	PASTURED WOODLAND	Woodlands that are grazed by livestock.
Zr	REFORESTATION	Land supporting a stand of artificially stocked trees.
B	BUILT UP	Urban related uses.
X	SWAMP, MARSH	Supports vegetation characteristic of a depressed and poorly drained area.
E1	EXTRACTION	Sand and gravel pits and quarries.
E2	EXTRACTION	Topsoil removal.
T	SOD FARMS	Public or commercial sales.
R	RECREATION	Parks, golf courses, campgrounds, etc
K	SPECIALTY AGRICULTURE	Orchards, market gardens, etc.
W	WATER	Rivers, streams, etc.

MAP No. 44 - 4

The Forestry Agricultural Resource Inventory is part of the New Forests in Eastern Ontario Program. It is equally funded by the Federal Department of Regional Expansion and the Ontario Ministry of Treasury and Economics under the Communities and Rural Resource Development Subsidiary Agreement.

This map is published by the Food Land Development Branch, Ontario Ministry of Agriculture and Food. The data was collected by staff under the supervision of the Ministry of Agriculture and Food and the Ministry of Natural Resources. Appreciation is extended to the Land Resource Institute, Agriculture Canada for their assistance with the inventory. The cartography was prepared by the Department of Land Resource Science, University of Guelph, Guelph.

Base Map: Department of Energy, Mines and Resources Topographic Sheet(s) 31G/12, 31G/13, 31G/16, 31G/17 — 1:50,000

44 - 4

NOTES

NOTES

NOTES